INTERNATIONAL PROJECTIONIST

FEBRUARY 1955

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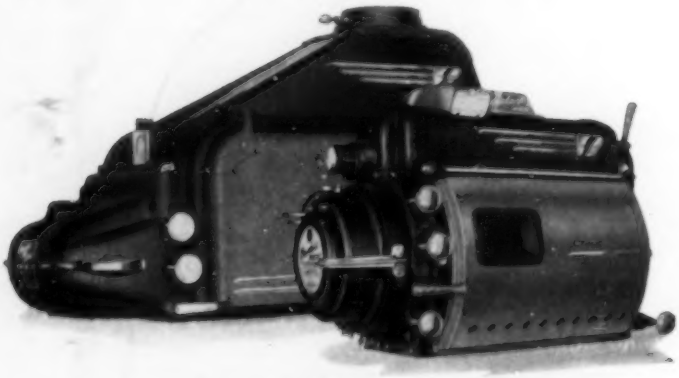

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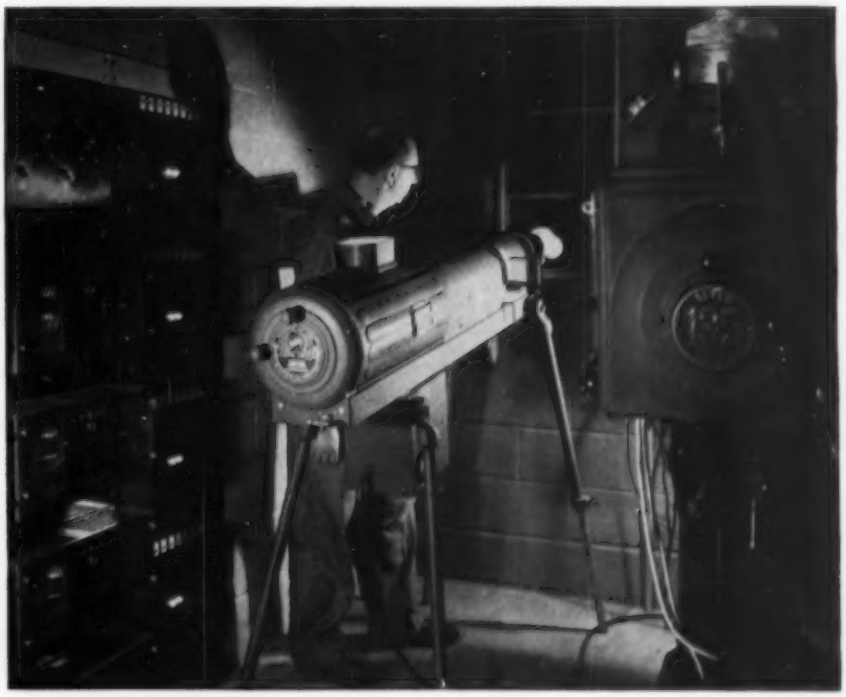

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INTERNATIONAL PROJECTIONIST

JAMES J. FINN, *Editor*

JAMES MORRIS, *Associate Editor*

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9E

Monthly Chat

All Industry Branches Interdependent

IP has long been the dumping-ground for complaints on the score of its "destructive" as opposed to what other segments of the industry consider a "constructive" attitude with regard to the various "new" processes in the exhibition of motion pictures. This situation is the result of an admixture of editorial independence stemming from IP's unique position of non-reliance upon producer-distributor advertising income and the financial transfusions provided IP by its unique direct-paid circulation.

That which is considered IP's "destructive" attitude boils down to its high regard for contributions of the technical personnel of this industry. Since this personnel must be paid MONEY for its effort, any champion of such a group is branded "destructive." Last month in this corner we said:

> "The critical point in the development of modern motion picture presentation was reached when the various 'new' processes engulfed the exhibition field. Technology, not subject to the whims of 'gadgets,' is gospel today."

Pretty words these; but their practical application is reflected by the expedient of *reducing* rather than *increasing* the manpower necessary for translating technological advances into economic health via paid admissions at the box-office.

Practically all the time the producers, distributors and exhibitors of motion pictures give off sounds which indicate that their labors in this never-never sphere of visual and aural fantasy are performed for the sheer fun of the doing. The result: manpower reductions in projection rooms. We could cite a few such recent examples, accomplished legislatively or by long and torturous "negotiation," but we believe that the craft is already well informed thereon.

Producers Are Still Sitting Pretty

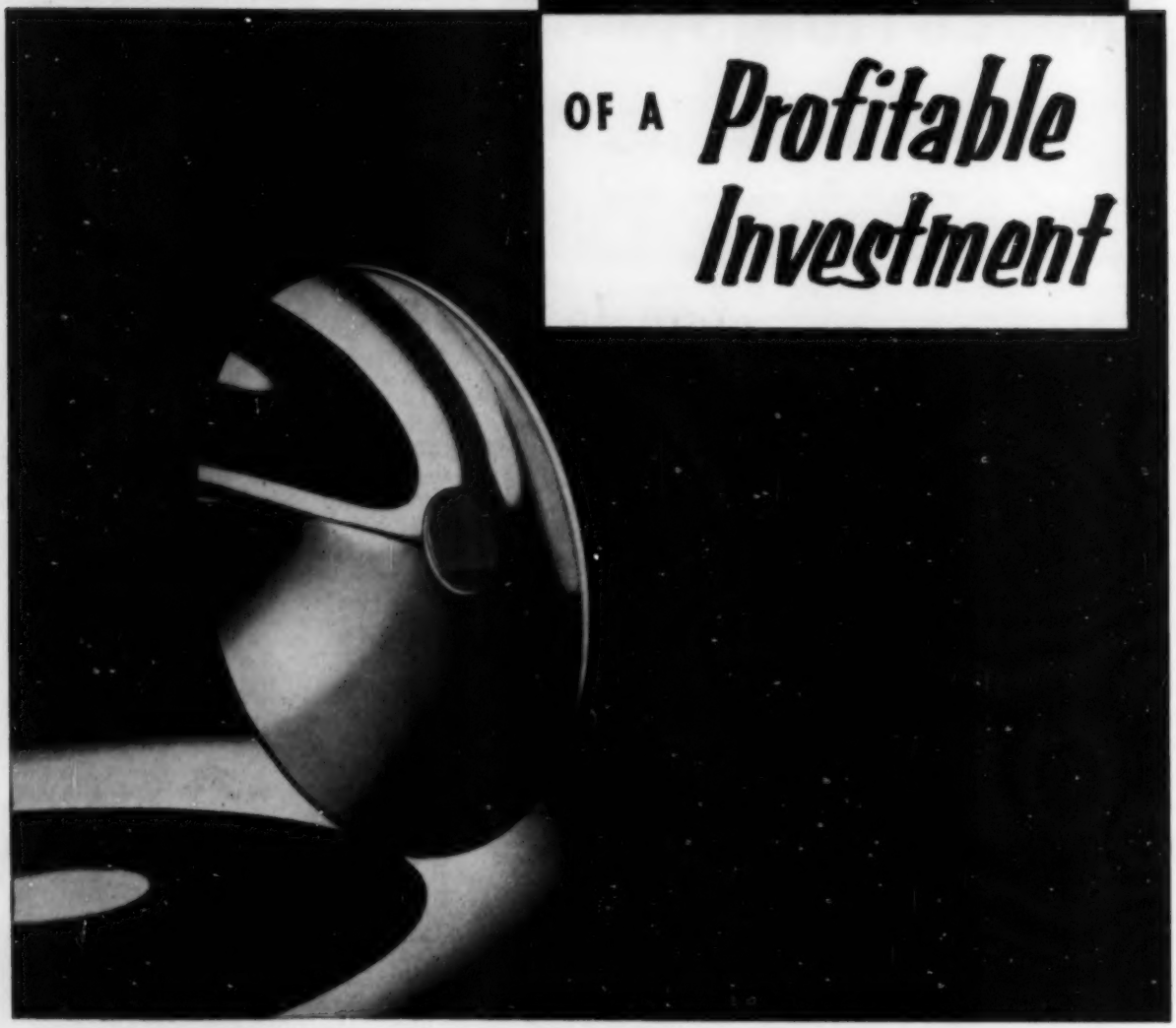
Itemized in the industry trade press within the past few days is the fact that one major producing-distributing company, Columbia Pictures Corp., announced a "record six-month *net profit after taxes and all charges* of TWO MILLION, EIGHT HUNDRED THOUSAND DOLLARS!" Other major companies are doing equally well. Columbia is not in the exhibition field, true, but its profits flow therefrom in the form of film rentals.

If the production-distribution branch of this industry continues to suck the economic lifeblood of this industry, then it will be only retributive justice that the exhibition end of this business die *via* the slow-strangulation route.

IP has long emphasized the economic fallacy of watering the leaves and neglecting the roots of the industry structure —and as of today the ROOTS of the industry are embedded in the solid foundation of technology. If proper recognition of this basic premise is not forthcoming in terms of adequate reward for those who translate this technological progress into stockholder earnings, this business as we know it today will die. Of course, the producer-distributor outfits will promptly turn to the making of films for Tv, preparations for which on a broad scale are already in the making.

IP militantly advises a militant attitude toward even a suggestion of any reduction in manpower or wages. IP's attitude is best expressed by the phrase "No tickee, no washee."

A PICTURE OF A *Profitable Investment*



■ **The brilliancy of your projected pictures, regardless of the efficiency of all other equipment, is dependent directly upon the condition of your lamphouse reflector. The only light which can reach your screen must necessarily be reflected to it by this mirror.**

■ **All reflectors gradually deteriorate to a state where replacement cost becomes insignificant, since a drop of only 10% in their reflective efficiency results in a corresponding decrease in screen brilliancy, and accordingly also represents a loss amounting to 10% of the cost of your current and carbons.**

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Vol. 30, No. 2

February 1955

Admittedly, there are few Ph.d's in projectionist ranks, but for down-to-earth knowledge and practical application of the projection process, they have no superiors. Added weight to this statement is lent by one of our boys who labored industriously and, with great care and skill, compiled the data presented in the appended article. Comment thereon is invited from craft ranks.

A 60-Degree Geneva Intermittent Movement?

By J. G. JACKSON

Member, IA Local 348, Vancouver, B. C., Canada

EXTENSIVE experiments conducted over a considerable period of time with the Geneva intermittent movement used in motion picture projectors included the building and testing of three separate models as follows:

1. A 5-to-1 ratio to obtain a screen light efficiency of 71.6%.
2. A 5-to-1 ratio with timing for television to obtain 60 exposures per second.
3. For slow-motion projection from standard 35-mm film, also timed for 60 exposures per second.

The writer believes that the results of these experiments will prove interesting not only to the projectionist craft but also to projector manufacturers.

Geneva Movement Basic Design

Figure 1 illustrates the basic design of a double-cam Geneva intermittent movement. A standard Geneva four-sided star and a four-frame film sprocket is used. The cam is double-ended with cam pins mounted on both ends at 180 degrees apart on the circumference of the cam. This double cam is mounted on a spline shaft so as to slide back and forth.

A pin in a yoke engages with a slot in the right-hand end of the cam. The yoke is pivoted at its lower end, while the upper end is coupled to an arm which is driven by a crank pin mounted on the end of a driving gear. The driving gear is coupled to the spline shaft by a mating gear with a ratio of 3 to 1.

As illustrated, the cam is at the extreme left of its travel on the spline, and the right-hand pin is engaged with the star. As the cam revolves with the spline shaft, the yoke will move it to the right on the spline, and when it has turned 1½ revolutions it will be at the extreme right of its travel so that the left-hand pin will engage the star. Then as it turns another 1½ revolutions it will again be back to the position shown.

Thus the cam revolves 540 degrees for each movement of the film sprocket, and with a 90-degree star, this gives a 5-1 ratio instead of the 3-1 in the standard movements. Thus a 60-degree intermittent.

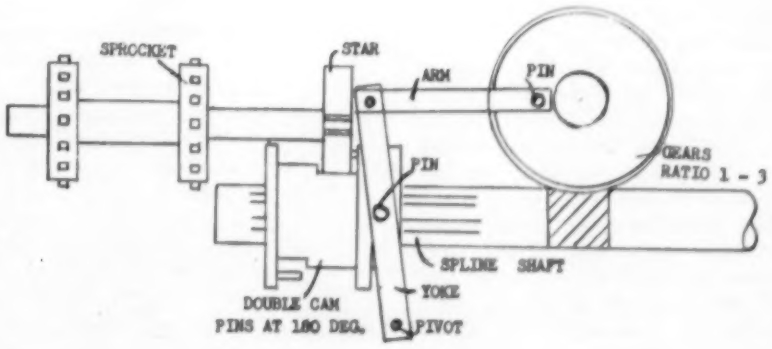
This experimental movement was used in a projector using a focal plane disc shutter revolving at only ⅜ inch from the film. Experiments were conducted with two different shutters; first, a single blade revolving at twice normal speed, or 2880 r.p.m., with a blade width of 102 degrees. This gave an efficiency rating of 71.6% with absolutely no travel-ghost.

Then the two-wing shutter was installed and revolved at standard speed of 1440 r.p.m., with blades of 54 degrees which gave an efficiency of exactly 70%.

Refer to Chart 1 to compare this with the standard projectors of less than 59% efficiency.

With this fast pull-down there is the question of film life. A life test was conducted with a loop of nitrate film, while using only a small wattage Mazda lamp for a light source to keep heat from the film. The loop ran through the projector 4,000 times,

FIGURE 1



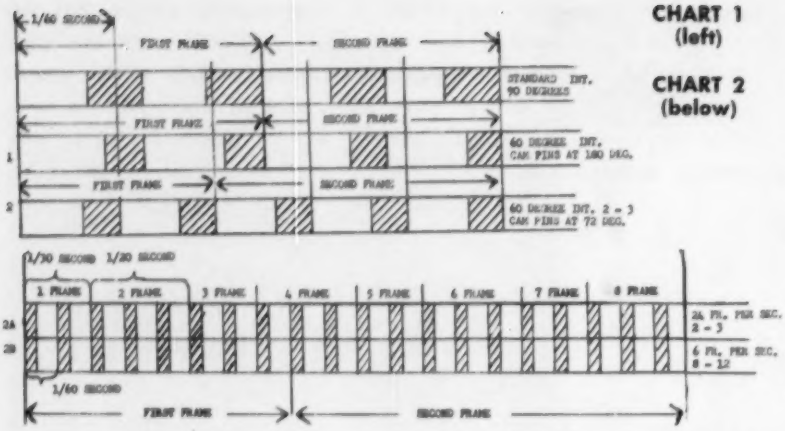


CHART 1 (left)

CHART 2 (below)

and while the sprocket holes were showing signs of deterioration they were not beyond running condition and there was no sign of unsteadiness of the picture image on the screen.

The film did break once at the splice during the test run, and again at the splice just after passing the 4,000 mark. The latter time the film caught on the sprocket and tore beyond repair, so thus ended the test. Were it not for this, it probably would have gone to more than 5,000 runs before sprocket holes failed.

Timing for Tv Presentations

After the aforementioned test the projector was dismantled and rebuilt so as to get the 2-3 timing for television:

Figure 2 shows the same double-cam principle in use, but this time the cam pins are set at only 72 degrees apart. The yoke is in one piece and is pivoted at its upper corner, and a pin in the end of the driving gear engages with a slot in the yoke. This gives an uneven movement back and forth so as to coincide with the timing of the cam pins.

Degree of Cam Engagement

As illustrated, the right-hand pin is engaged with the star, and it is assumed that the driving gear is turning to the right. When it has turned 144 degrees, the cam will be at the extreme right of its travel on the spline, and the left pin will engage the star. During this time the cam will have revolved 432 degrees. Then, while the drive gear completes its revolution by turning another 216 degrees, the cam will be to the left and will have revolved a total of 1080 degrees, or 3 complete revolutions.

With this a two-wing shutter with 66-degree blades was used and it revolved at 1800 r.p.m. While the cam turns 432 degrees one frame will be exposed twice, and while the cam turns 648 degrees the next frame will be exposed 3 times. Thus the result is a 2-3 intermittent giving 60 exposures per second from 24 film frames per second. The 66-degree shutter blades give an efficiency rating of 66.3%. Refer now to Chart 2 and compare this with Chart 1 relating to standard projection.

Again the projector was dismantled and reassembled for slow-motion projection.

Slow-Motion Frame Projection

Figure 3 shows the arrangement that gives slow-motion projection from any standard release print. Scenes photographed in slow motion appear on the screen in *ultra*-slow motion.

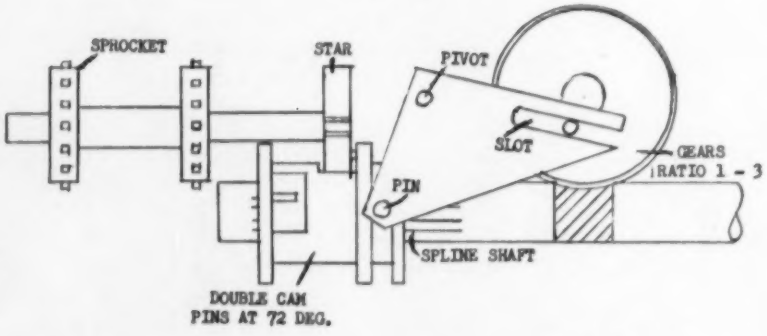
Here again the double cam is employed with the cam pins set at 72 degrees apart. The yoke is pivoted at the upper corner, and a pin which is set in the right-hand end of the yoke engages with a grooved cam which is mounted on the end of the driving gear.

The grooved cam has two extremities set at 144 degrees apart, and between these there are two neutral positions. As shown, the right pin is engaged with the star. When the driving gear turns to the right, and the star and sprocket come to rest, the pin following the grooved cam on the gear will shift the Geneva cam over to a central or neutral position where it will remain for a period of time.

While in this neutral position the Geneva cam will revolve almost 5

(Continued on page 24)

FIGURE 2



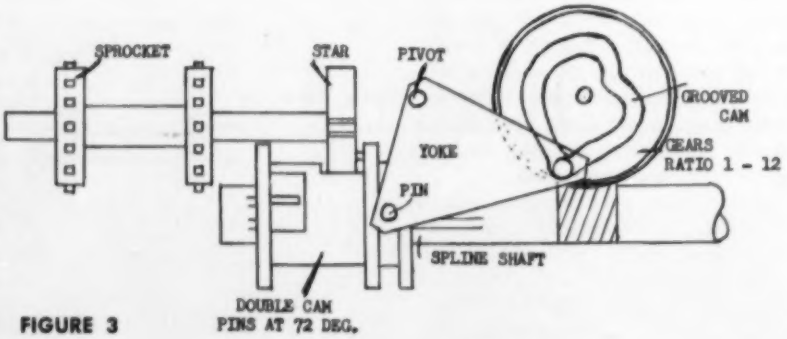


FIGURE 3

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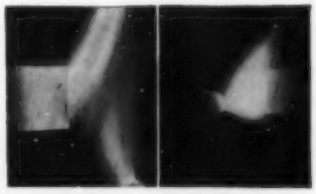

THE PICTURE IS LIGHT...
GIVE IT ALL YOU CAN
with "NATIONAL" CARBONS

THE NEED FOR MORE and better projection light began with the first "flicker" and grew as the industry grew. From the very beginning, "National" carbons have satisfied projectionists' demands for brighter, whiter light and slower, steadier burning.

SINCE "NICKELODEON" DAYS, the brightness of "National" projector carbons has been increased more than 1000 per cent! And, today, with giant screens becoming almost universal, arc-carbon progress continues to meet the challenge.

FOR EXAMPLE, the new "Suprex" 8mm carbon, latest in a long series of recently improved "National" carbons, provides *15% more light* and a higher color temperature than its predecessor – at *no increase in cost!* Yes, the picture *is* light... and with "National" carbons you are sure of getting it in fullest measure.

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times, or 1728 degrees. During this time the shutter will expose the film frame 8 times. When the driving gear has turned 144 degrees, the yoke will shift the cam to the right so that the left pin will engage the star and move the film to the next frame. Then the cam will shift back to neutral again and remain there for another period of time. This time the cam will revolve more than 7 times, or 2592 degrees, and the shutter will expose the film frame 12 times.

Thus the film frames are exposed alternately, one frame 8 times and the next 12 times, while the film passes through the projector at the rate of only 6 frames per second. The two-wing shutter revolves at 1800 r.p.m. giving the 60 exposures per second for television.

Chart 2A is a condensed form of chart 2 and shows 8 frames of film timed at 2-3. Chart 2-B shows that of slow-motion projection of only 2 frames which coincide exactly with that of the 8 frames above, each of which represent 1/3 second on the screen.

Speed, Flicker, Motion

With the high-speed shutter there is no flicker, and the image shift from frame to frame is very smooth on normal subject action, no jerk or jump is noticeable. If the subject action is fast, such as a car traveling broadside past the camera at high speed, then there is naturally some noticeable image shift.

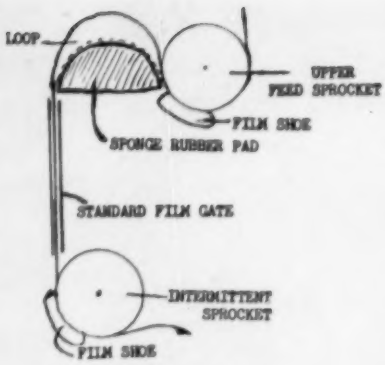


FIGURE 4

This slow-motion principle need not necessarily employ the high-speed Geneva cam but can be worked out at standard cam speed of 1440 r.p.m., which of course calls for wider shutter blades. It can also be attained with the cam pins at 180 degrees and at various cam and shutter speeds; also at any desired number of frames-per-second projection speed.

Thus the slow-motion principle is quite flexible. The use of this would apply to education or industry where it is desirable to retard normal screen action for close examination.

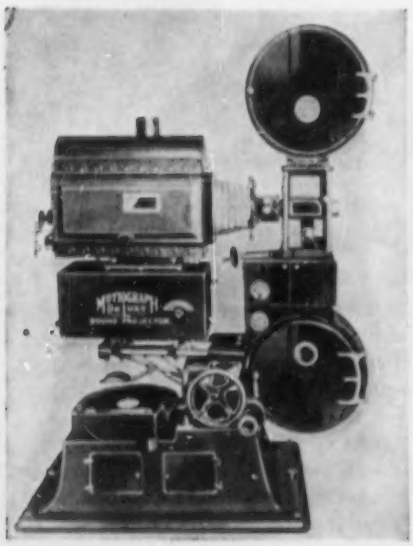
As mentioned previously, the life test on a loop of film was more than 4,000 runs. This long film life was obtained by the use of a special film-braking system which allowed the film gate tension to be reduced to a minimum, with only sufficient pressure to keep the film flat at the aperture. A sponge rubber pad is placed within the upper loop (Fig. 4).

At the beginning of pull-down the loop is full and does not touch the rubber pad. With very little tension at the gate, there is a minimum of strain on the film during the acceleration period. As the film slows down and comes near the end of pull-down, the upper loop comes in contact with the sponge rubber pad which applies the braking action to prevent the film from overshooting the aperture.

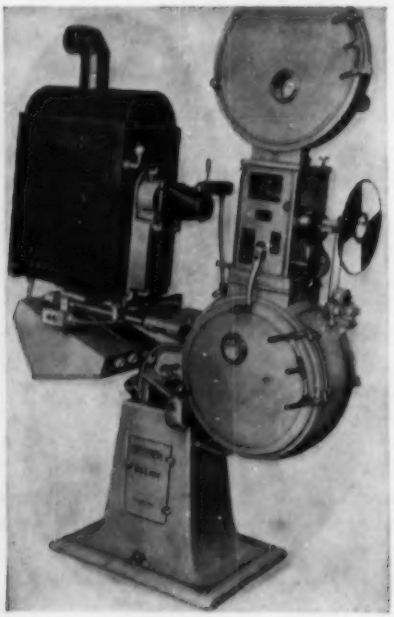
The braking action of the rubber pad acts in two ways: first, by friction on the surface of the film; and second, by pressure within the entire

(Continued on page 24)

PICTORIAL REPRESENTATION OF MOTIOGRAPH PROJECTOR PROGRESS THROUGH THE YEARS



Motiograph was ready for sound with the Model "H" in 1926. This model had the first double shutter, and introduced Motiograph's sound system which reproduced sound on film and Vitaphone records.



Model F (1921) enclosed mechanism for first time; shutter had two blades and a timing device for increased operating efficiency.

Motiograph's postwar projector; the Model AA, latest of the line, was brought out in 1946. It embodied radical improvements in performance and operation. It is shown here on an S base with 25-inch magazines.

The Todd-AO Projector For Both 70- and 35-mm Film

LATEST ENTRY in the wide-screen sweepstakes is the Todd-AO process details of which have until recently been shrouded in secrecy. In early February this veil of secrecy was rent and permitted the seeping through of those facets of the projection process which are appended.

The Todd-AO system is unique among the current wide screen processes in that it utilizes 70-mm film for both photography and projection. The advantages of such a film size in terms of fine grain structure and additional screen light are obvious. Another feature of the system is that the projector can utilize both 35- and 70-mm film, this being accomplished by dual sprockets and the simple insertion of a different gate for 35-mm

25 Roadshow Openings

The Todd-AO projectors were made by the well-known Philips organization in Eindhoven, Holland, the original order being for 50 which would serve for 25 roadshow openings in major cities in the U. S. A. The premiere public showing of the process will occur early in May in New York City when the Todd-AO film "Oklahoma" bows. All 70-mm films will be produced by the Todd outfit itself.

Precise technical data anent this new 70-mm projector are lacking, thus the information presented here, which emanated from the Todd people, must be considered as exploratory in nature.

Claims for Versatility

Todd-AO avers that the new projector, designated the DP70, is suitable for:

1. 70-mm film with any number of magnetic sound tracks.
2. 7-mm film with separate sound film.
3. CinemaScope film with four magnetic sound tracks.
4. CinemaScope film with optical sound track or Perspecta sound.
5. Wide-screen films of any size, provided with either magnetic or optical sound tracks.
6. Standard 35-mm film.
7. 3-D films according to the single-film system.
8. 3-D films according to the twin-film system.

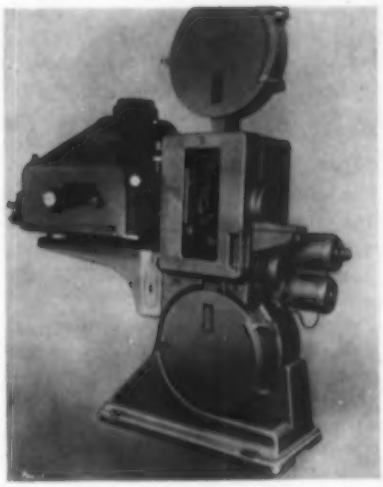
Such versatility sounds like a large order, but actually the switchover from one type of film to the other is easily accomplished by the use of the supplementary parts supplied by Todd-AO. For example, it is not necessary to change any sprockets for the changeover since all sprockets have two sets of teeth to accommodate both 35- and 70-mm film. The 35-mm sprocket teeth are slightly recessed in relation to the outer 70-mm sprockets so as not to interfere with the wider film.

Sound Reproduction Facilities

The outer flange of the intermittent sprocket has 20 teeth; the inner flange has 16 teeth. All sprockets are universal, as are the firetrap rollers, and need not be replaced when switching from 70- to 35-mm projection. Incidentally, this switchover is said to require only ten minutes, with the mask for 35-mm film being inserted in a few seconds.

Sound reproduction facilities have been mentioned previously. The Todd 70-mm film will have six sound tracks; and adaptation for other mediums of sound reproduction may be easily accomplished.

The soundhead for the scanning of magnetic sound tracks is located on the top part of the projector. Either a scanning head for 70-mm film or a scanning head for CinemaScope film can be placed on two guide pins at the top of two rotating sound drums. The guide rollers of the soundhead and all other guide and pad rollers that are in contact with the magnetic soundtrack are made of nylon. The soundhead may be removed as one unit by simply loosening four screws.

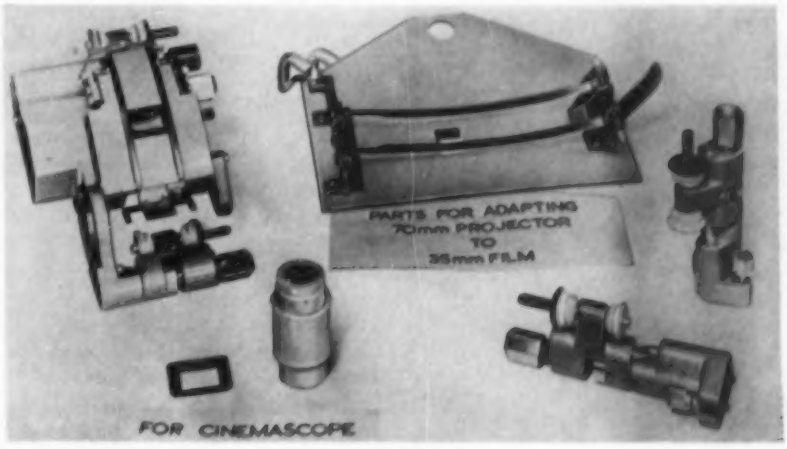


Full view of the Todd-AO all-purpose projector which will handle normal 35-mm film, 70-mm film, single- and double-film 3-D systems, and any number of sound tracks.

Drive, Dual Sprockets, Speed

The driving mechanism is housed in an oil-tight casing, sealed hermetically by means of a large cover to protect it against dust. The cover is fixed with five screws which may

Parts which have to be suited or added for projection of other than Todd-AO 70-mm film. Modification requires only 10 minutes. The mask of the gate for 35-mm film projection can be replaced in a few seconds for CinemaScope or other wide-screen ratios.



be easily removed for inspection of the mechanism.

All sprockets, the intermittent mechanism, the shutter and the take-up, are driven by a vertical main shaft. This shaft in turn is driven by a horizontal shaft, which also drives the spur-gear oil pump located at the bottom of the projector housing. All of the gear-wheel transmissions and bearings are lubricated by an oil conduit with tappings.

The projector provides for two different film speeds. The horizontal driving shaft of the projector is coupled directly to a driving motor for a speed of 30 frames per second when 70-mm film is running. This same driving shaft can be coupled by a gear-wheel transmission to another motor for the standard speed of 24 frames per second for 35-mm film. Two separate drive motors are used rather than a speed-change gear box because they permit a simpler system of construction.

Gate and Screen Curved

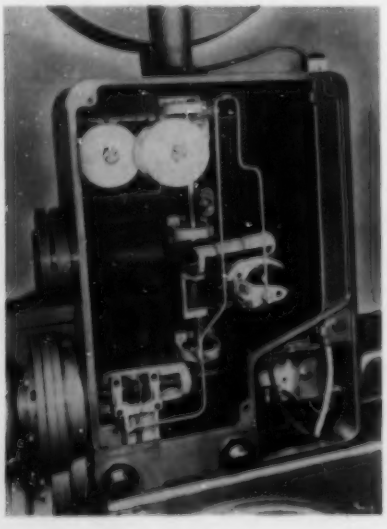
Todd-AO presentations will, of course, utilize a screen with a center depth curve of 15 feet. Overall picture size is expected to approximate 25 feet high by 51 feet wide, a 2/1 ratio.

A curved projector gate will be used in order to minimize the tendecy of the much wider 70-mm film to bend and thus get radically out of focus. Standard pressure pads have been replaced by thin strips which are attached to a hinged plate. Pressure in the gate can be adjusted by tightening or slackening these strips.

The hinged plate faces the shutter and must be pushed aside for threading the film. The problem of the positioning of the shutter just behind the gate was overcome by providing that the knob for pushing aside the plate can be operated only when the shutter is in such a position that the plate can pass freely. It is impossible to start the projector when the plate has been pushed aside.

A single-blade conical shutter of very large diameter is used. At a film speed of 30 frames per second the shutter rotates at 3600 r.p.m.; while at a speed of 24 frames per second its speed is 2800 r.p.m.

Driving mechanism of the projector, housed in oil-tight casing which is closed hermetically by means of a large cover. Cover is fixed by five screws, easily removed for inspection.



Cooling Means, Magazines

Water and air cooling of the projector gate and the film are utilized. Todd feels that water cooling is insufficient, and may even have a negative effect, because of the difference in temperature between the image area and the edges of the film frame, thus inducing buckling. The shutter is relied upon to suck in cool air and blow it upon the film.

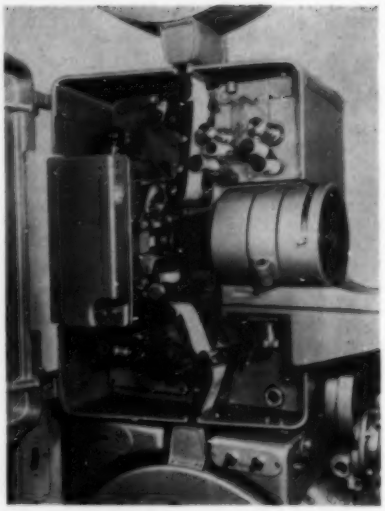
Sleeves with different inner diameters can be mounted in the lens holder to accommodate various projection lenses. For 35-mm projection the optical axis is shifted to proper position by means of a small knob in the slit of the lens holder.

The film magazines accommodate 3,100 feet of 70-mm film, thus allowing an interval of 22 minutes between changeovers. Magazine shafts are ½ inch in diameter. Both magazines have adjustable friction devices, with the upper magazine being illuminated and having running-time scales relating to both 70- and 35-mm film.

The structure of both the mechanism and the base are said to enable the use of any arclamp provided its optical characteristics are suitable for the Todd film image. It has been bruited around in the trade that at all private showings of the Todd process to date 280 amps was the current level.

One Informed Opinion

One nationally-known projection supervisor who witnessed such a showing discounted this talk and said he saw no reason why 180 amps at the most shouldn't suffice. He pointed to the double-frame showings at the Radio City Music Hall (N. Y.) as "proof of the pudding." Supplementary comment on the Todd showing by this same personage ran as follows.



For purpose of achieving perfect definition, the distance between film in the gate and projector lens does not vary. Projector is equipped with curved runner plate. The slight bend in longitudinal direction gives film greater stiffness in transverse direction.

"The quality of the picture was very good—and why shouldn't it be under such favorable conditions? The images were sharp, bright and steady. But, as with all curved screens, there inevitably was distortion of the screen image.

"The nature and extent of this distortion depends upon one's seating location. I was seated at the right. Players entering the scene from the left appeared to me to be stout; as they approached the center of the scene their figures appeared normal; as they continued toward the right side they grew thin.

"To a person seated at the left of the theatre the effect would have been just the reverse. The same fault is apparnt in any curved screen, with the degree of distortion depending upon the depth of the screen curvature. This may not be objectionable to the general public, since they don't beef about the same fault in Cinerama. Of great benefit to Todd-AO was the fact that the picture was in sharp focus over the entire screen area.

"My personal opinion is that the Todd system represents essentially just another wide-screen process and that like all other screen presentations the vital factor lies not so much in the

(Foot of Col. 1, next page)

World-Wide Concern About Technological Standards

BRITISH FILM circles are also seriously concerned about the lack of technological standards anent the screen image aspect ratio. This concern was rather forcibly expressed at a recent meeting of the British Kinematograph Society (Theatre Division) which, not surprisingly, was well attended by engineers and projectionists but fell dismally short in terms of exhibitor attendance.

Presiding over the conclave was an old and valued friend, R. E. Pulman, a practical projectionist (Circuits Management Assoc., Ltd.) who is remembered affectionately by the many friends he made upon the occasions of his several visits to the U. S. and Canada.

Through the medium of *The Ideal Kinema*, British trade journal, IP is privileged to present the following summary of the discussion.

THE FORUM was opened by Dr. Leslie Knopp, who stated that the philosophical aspects were not outside the scope of the discussion. With the 3-D picture, he continued, the idea was to bring the picture into the audience, while with wide-screen presentations it might be said that the idea was to bring the audience into the picture.

No Proper Aspect Ratio?

Dr. Knopp said that in the matter of screen shape and size, the industry was like Stephen Leacock's hero, who mounted his horse and dashed off in all directions. Some months ago he had taken steps towards a standardization of aspect ratio, but had been told by every section of the trade that standardization was premature.

However, he put forward the proposal that two ratios should be established—at 1.75 and 2.55/1, a proposal which met with general support.

G. E. Fielding, chief engineer of Associated British Cinemas, pointed out that in America a number of producers were shooting only in CinemaScope, with the idea that non-anamorphic prints might later be made. A ratio of 1.85/1 would result in cropping about 12% of the picture, and he recommended this, rather than the lower figure.

S. B. Swingler, engineering controller of Circuits Management Assoc., took the opposite view, pointing out that a majority of films were still being photographed on old-type cameras for ratios of 1.6 or 1.66/1 and neither studio nor laboratories wished to make changes at this stage until a new standard was adopted. Foreign films shot for the 1.33/1 ratio and shown with superimposed titles could not be cropped.

"Letter-Box" Screen Image

J. A. Walters objected to the "letter-box" effect of the CinemaScope picture when seen from the back seats. VistaVision was returning nearer to the old ratio. In the old days the better seats were at the rear, but now the technician was reversing the trend. The tastes of patrons, he thought, must eventually decide the question of ratio.

Walter Lassally, supporting this view, suggested that the high aspect ratio had been adopted as a result of the low overhanging balconies of many American theatres, which prevented the screen being increased in height. He urged that the BKS should recommend the retention of the old standards of 1.33/1, which had been originally determined as a compromise to suit various types of composition.

J. L. Stableford, the screen maker, disagreed with this proposal. He considered the old picture size too small. Since the limiting factor in many theatres was the height of the picture, any increase must be in width. But a too large picture suffered from grain trouble. We had had no chance of passing judgment on any ratio between those of CinemaScope and wide-screen, he said, and we must eventually decide whether we were giving the public what they wanted.

Image Ratio Change Forecast

He suggested that a time might come when wide-screen ratios would go up and CinemaScope ratios come down, so that eventually we should have the one shape of picture and variable screen masking would be a thing of the past. He thought every theatre should show a picture of 1.75/1 ratio.

R. Butler, a Gaumont projectionist, objected that recent developments were proving detrimental to the seats that were most filled at the front and sides.

Martin Beer, joint sales manager, GB-Kalee, said that he was primarily concerned with meeting the requirements of independent exhibitors. One problem was: how was picture ratio going to affect sight lines? The IES regulations fixed the maximum height of picture, and dependent upon that and on the width of the proscenium, he had to consider whether it was possible to get in a CinemaScope picture. Often movable masking was necessary—generally at both top and sides.

An exhibitor might want the 1.33/1 ratio as well as the 1.66/1 and the CinemaScope ratios. He pointed out that the variable anamorphic lens could

(Continued on page 29)

TODD-AO

(Continued from page 12)

form of presentation as in high entertainment content."

Numerous skilled technicians have had a fling at 70-mm film projection, the best remembered probably being the George Spoor 65-mm effort in the 1930's, and the Fox Film whirl with Grandeur during the same period. Whether Todd-AO has licked the problem remains to be seen; but if their pictures are to be confined to roadshow situations and no 35-mm prints released, the matter is hardly one of industry-shaking consequence.

"Tomorrow night we'll sit on the other side of the theatre and see the rest of the show."

Submitted by Norman G. Campbell, Campbelltown, N. S. W., Australia.

Light Sources For Film Projection

By ROBERT A. MITCHELL

The vital part played by magnetism in the behaviour of the high-intensity arc, and the controversy anent water-cooling carbons for greater screen brightness are covered in the second instalment of this series.

MAGNETIC effects are extremely important in H-I arcs. An electric current sets up a magnetic field around the conductor through which it travels. The carbon and arc-stream of an arc conduct electricity and they are also surrounded by magnetic fields. Beck made these fields *push* the flaming gas into the positive crater by distorting them.

It is easy to demonstrate the great sensitivity of the arc-stream to magnetism by bringing the tip of a magnetized screwdriver close to a burning arc. The magnetism of the screwdriver repels the arc-stream like a blast of air, and, if brought too close, will actually blow out the arc.

When the carbons in an arclamp are positioned horizontally, as in a low-intensity mirror lamp, the magnetic field is uniform. By positioning the negative carbon *at an angle* to the specially cored positive carbon, Beck made the magnetic field dense underneath the arc and comparatively weak above it, as shown in Fig. 2. Since the arc-stream gases have a tendency to move into the region of weaker magnetism, this clever expedient served to push the radiant gases into the crater, where they get very hot before overflowing into the arc-stream and tail-flame.

Not all of the heat comes directly from the positive crater, however. The electrons which travel across the gap from negative tip to positive crater must penetrate the gas-ball. The rare-earth atoms of the gas-ball are accordingly bombarded by a dense stream of electrons; and this continual bombardment excites the atoms into a state of super-brilliance.

H-I Arc Current Density

Because the Beck arc requires a higher current-density than the old-type carbon arcs—that is, a higher amperage for the specific diameter of positive carbon used—the Beck arc is usually called a *high-intensity* arc, and the ordinary arc a *low-intensity* arc. The term "intensity" refers to current (the "I" of electrical formulas), *not* to light—though, of course, H-I arcs are indeed brighter than L-I arcs.

It is this high current-intensity of H-I arcs which is responsible for the very deep positive crater. The crater of the L-I arc is relatively shallow—almost flat, in fact. Now, the great depth of the H-I crater is very necessary as a receptacle for the gas-ball, which would otherwise stream away in the tail-flame and be utterly lost.

Contrary to popular opinion, the flaming materials of the H-I arc are not ionized to an appreciable extent. Careful tests have discovered some ionization, but it is not important. The atoms are *excited*, which means that the planetary electrons of the rare-earth atoms shift back and forth between low-energy and high-energy orbits—but the voltage at the arc is not sufficiently high to strip the atoms of electrons.

Crater Gap-Space Important

As we know, about 90% of the total light of the L-I non-flaming arc comes from the crater of the positive carbon, and of this fully 100% is due to white-hot solid carbon. In the H-I arc, only about 65% of the total light comes from the positive carbon (5% coming from the negative tip and 30% from the arc-stream), and three-fourths of this 65% emanates from the luminescent gas ball, and about 25% from the white-hot solid carbon of the crater floor.

If the lip of the positive crater accidentally breaks off so that the gas-ball streams out, the light drops to about 25% of normal and turns yellowish. This may happen if the carbons are jammed together too hard when the arc is struck; but the carbons are so quickly consumed in H-I arcs that a new crater of proper depth is quickly formed.

Mention has been made of the light of the L-I arc as "white." The L-I arc-light is indeed whiter than the light produced by the glowing tungsten filament of an electric lamp bulb, because the temperature of the carbon crater is higher. But the H-I arc is even whiter, more closely matching the color of noonday sunlight. The flame materials added to the cores of H-I positive carbons are responsible for the perfect spectral balance of this light source. When a yellower light is desired (such as when 16-mm color films are to be projected) a slightly different core mixture may be used.

So important is a symmetrically-formed positive crater to the satisfactory performance of the H-I arc that the positive carbon is rotated by the feeding mechanism. This method renders the position of the negative carbon less critical and eliminates the need for troublesome vertical and horizontal negative adjustments. Moreover, the current is applied to the carbons close to the arc, eliminating the undesirable voltage-drop which would occur if the current were made to travel through the entire length of the carbons.

Operational Procedure Vital

Many of the problems overcome by the regular H-I arclamp reappear in the so-called "simplified" H-I arc, which is anything *but* simplified. This modified form of H-I arc does not

Aperture Plates with Retaining Springs Available in the Following Ratios From LaVezzi, Chicago

PART NO.	RATIO	SIZE	
SP-672-E	1:33:1	Standard	.600 x .825
SP-672-E-0	1:33:1	Undersize	.600 x .800
SP-672-E-1	1:66:1	Standard	.400 x .825
SP-672-E-2	1:66:1	Undersize	.490 x .800
SP-672-E-3	1:85:1	Standard	.440 x 825
SP-672-E-4	1:85:1	Undersize	.400 x .800
SP-672-E-5	1:75:1	Standard	.460 x .825
SP-672-E-6	1:75:1	Undersize	.460 x .800
SP-672-E-7	2:1	Standard	.400 x .825
SP-672-E-8	2:1	Undersize	.400 x .800
THE FOLLOWING FOR CINEMASCOPE:			
SP-672-E-10	2:55:1	Undersize	.650 x .850
SP-672-E-12	2:1	Undersize	.650 x .650
SP-672-E-14	2:33:1	Undersize	.650 x .775
*Pat. Pending			$2.90 each.

work as well and is much more difficult to operate satisfactorily, than the regular H-I arc having a rotating positive carbon and an inclined negative carbon.

In general plan, a "simplified" H-I arclamp resembles an old-style L-I reflector lamp. Both carbons are positioned horizontally, and both are grasped by the carbon jaws near their ends, the current travelling through long lengths of carbon. Two serious difficulties arise—lack of a non-uniform magnetic flux to hold a gas-ball in the positive crater, and loss of current by forcing a heavy amperage to flow through long lengths of small-diameter carbons.

Special means have been employed to solve these problems and make possible the use of cheaply-manufactured lamphouses. The advantages of the "simplified" H-I arc over the *regular* H-I arc are solely economic, and have nothing to do with projection quality.

The problem of creating a luminescent gas-ball and holding it in the crater of the positive was solved, they say, by placing a magnet in the lamphouse. This is usually positioned behind the mirror, its poles being rather low so as to push the arc gases up and back into the crater. Without this magnet, the H-I effect is lost, and the arc operates as a rather inefficient low intensity flaming arc.

The strength of the magnet is a critical factor in the operation of these lamps. The better lamps have electromagnets connected in series with the arc in order to ensure a change in magnetic flux with a change in current.

Permanent Auxiliary Magnets

Permanent auxiliary magnets are often positioned underneath the arc to help stabilize the flame, but the main electromagnet does most of the work. The strength of the electromagnet should be adjustable to enable the projectionist to establish burning conditions best suited to the trim and arc-gap he prefers.

The problem of feeding the current to the "simplified" H-I arc is solved by plating the carbons—both the cored positive and the solid negative —with copper. Copper conducts electricity very well and prevents the voltage-drop which would occur if uncoated carbons were used. A *constant* voltage-drop would not be too serious; but variations in "drop" caused by variations in the length and conductivity of the carbons would make the arc very unstable and uncertain in terms of light production.

The copper coating on the carbons should be sufficiently thick to deliver without loss the full current at which the carbon trim is rated by the manufacturer of the carbons, and it should not include any loss due to carbon voltage-drop. If the copper is thick enough, there will be no appreciable carbon drop!

Scarcity Expedients Unworkable

During World War II the scarcity of copper forced the manufacturers of carbons to apply thinner coatings to their "simplified" H-I carbons. These carbons did not burn satisfactorily at full current rating or, in fact, at any current. There is no serious shortage of copper at present.

The basic principles of the regular L-I arc, the flaming L-I arc, the regular H-I arc, and the so-called "simplified" H-I arc have now been reviewed, but much more remains to be told about these and other light sources used for the projection of motion-picture films.

If the reader will consider briefly what has been said about each type of arc, and then stop to ponder the many special features and operating peculiarities of each, he will undoubtedly think of a number of things which we have not mentioned at all. We have yet to describe the effects of changes in voltage and current, the volt-ampere characteristics required of a power source for arclamps, the effect of water-cooling the carbons, the optical problems connected with arclamp design, *etc.*

Instead of taking up these matters (important to projectionists) in systematic order, let's jump around a bit. Water-cooling the carbons of the high-intensity (H.I.) arc is certainly an interesting topic, and a very controversial one, too!

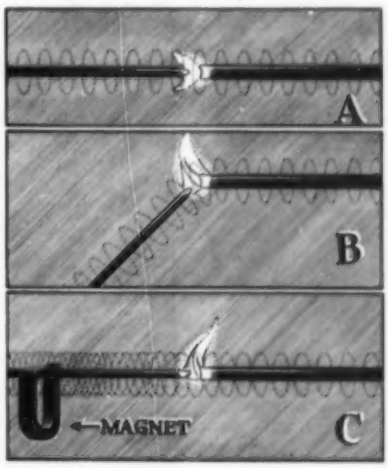


FIG. 2. The high-intensity arc requires a specially-cored positive carbon, high-current density, and a non-uniform magnetic field at the arc to hold the luminescent gases as a radiant ball inside the deep crater. This gas-ball is even brighter and whiter than the hot carbon of the crater.

***A* shows what happens when the magnetic field is uniform. The luminescent gases stream out of the crater and become too thin to glow brightly. Such an arc resembles the old-style flaming arc.**

***B* illustrates how this arc may be made into a real high-intensity arc. It is only necessary to position the negative carbon at an angle to render the natural magnetic field of the flowing current (indicated by the faint circles) dense below the arc and thin above it. The glowing gas is thus pushed into the crater and held there as a luminous ball.**

***C* shows the method employed in the "simplified" high-intensity arc. A magnet furnishes the desired magnetic field.**

Effect of Water-Cooling on Arc

In order to understand what water-cooling really does to an arc, it is absolutely necessary to have a good idea of the processes that take place inside a burning H.I. arc. These have been described previously, so we already know that the intense heat in the positive crater is due to the electrical resistance of a relatively cool layer of carbon gas (called the anode layer) which covers the crater floor.

In a word, the electrons travelling from the tip of the negative carbon to the crater of the positive carbon are slowed down by the anode layer. The "friction" (resistance) of this layer takes energy from the electrons and gives it to the crater floor where it shows up as heat—and plenty of it.

L. I. Arc Characteristics

In the low-intensity (L.I.) arc all of the usable light comes from the white-hot solid carbon of the positive crater. The carbon there is constantly boiling—or, rather, evaporating—but the moment the carbon turns to vapor it loses its brightness and goes into the arc stream and tail-flame. The carbon is thus gradually consumed.

The crater of the H.I. positive also has a floor of white-hot boiling carbon, but most of the light of the H.I.

arc comes from a super-brilliant ball of luminescent gas held inside the crater by magnetic forces. This gas, excited to great brightness by electron bombardment, comes from rare-earth salts and other "flame materials" vaporized by the heat of the crater from the core of the carbon.

Now, the presence of the luminescent gas-ball of the H.I. arc has an adverse effect upon the "anode voltage drop," or resistance of the anode layer. The rare-earth compounds are very conductive in a vaporized state, hence the resistance of the anode layer decreases. As a result, the temperature of the crater drops off, and the arc does not burn well. This is what happens when any H.I. arc is powered by a generator designed for L.I. arcs.

H. I. Arc Current Load

This problem was solved by increasing the current (amperage) and decreasing the voltage for H.I. arcs. With a heavier current the H.I. anode layer offers sufficient resistance to permit the arc to burn properly. But the heavier current does something else, too. It makes the positive crater very much deeper than the normal L.I. crater, which is almost flat.

Other problems created by the excessively high current densities at which H.I. arcs are operated involve methods of feeding the current to the arc. The carbons are too small to carry such currents through their entire length, so the current is applied to the carbons close to the arc in *regular* H.I. arcs; or the carbons are copper-plated, as in "simplified" H.I. arcs.

The comparatively great depth of the H.I. crater helps stabilize the luminous gas ball, but it also limits the amount of current which may be applied to the arc. If heat is generated in the crater faster than the carbon itself can carry it off, the crater burns back so far that the electrons take a shorter path to the positive carbon. They enter the hard shell surrounding the core; and when they do this the arc is said to be *overloaded*—it sputters and gives a flickering light.

Well, why not help the positive carbon get rid of its heat so that higher currents may be employed to give higher temperatures on the crater

(Continued on page 28)

Wendt House Party for Harry H. Strong

The Wendt party gang at ease — mugging the camera as usual. Left to right: Bill Gedris, Al Beaudouris, Fred Matthews, and Frank Kuehnle; seated: Harry Strong, Erwin Wagner, Harold Wendt, and Bert Martin.

HOW do theatre equipment manufacturers relax when they manage a few hours off from their business? Well, here is how eight of them, from various parts of the country, "played" when they gathered recently to honor one of their most prominent members. They ate 30 pounds of lobster, shuffled the pasteboards and reminiesced, for the most part.

Deserting their businesses for 36 hours, the men gathered at the home of Harold F. Wendt, head of Wendt Advertising Agency, Toledo, on January 15-16 to honor Harry H. Strong, president of The Strong Electric Co., Toledo, manufacturers of projection arc-lamps, rectifiers, reflector mirrors and other projection equipment, upon his retirement as a director of the Theatre Equipment Supply Manufacturers Association, (TESMA).

All Guests Equipment Notables

The Association staged its first trade show in 1946 in the Secor Hotel in Toledo. Between 40 and 45 equipment manufacturers were present. Today there is but one hotel in the country—the Conrad Hilton, Chicago—large enough to accomodate all the members and exhibits under one roof.

Harry Strong, dean of American projection equipment manufacturers, and Harold Wendt, his advertising and public relations counsellor for the past 30 years.

Those present at the Wendt lobster party included Fred Matthews current president of TESMA and also president of Motiograph, Inc., Chicago, the oldest manufacturers of motion picture projectors in America; Erwin Wagner, of Chicago, president of Wagner Sign Service, Inc., manufacturers of theatre marquee and other signs; William Gedris, Grand Rapids, Mich., president of Ideal Seating Co., manufacturers of theatre seating; and Al Boudouris of Toledo, president of Theatre Equipment Co. and Eprad, Inc., manufacturers of in-car speakers, and operator of the New Miracle Mile Drive-in and other drive-ins in Ohio, Michigan and Indiana.

Collectively they could write a documentary of the industry, from an equipment standpoint, virtually from the first "flicker" up to the present time. Mr. Strong is recognized as the dean of equipment manufacturers as well as one one of the country's outstanding projection lighting engineers. Also present, naturally, was the host, Harold Wendt, and Frank Kuehnle of the Wendt Agency. Present too, was James Strong, son of Harry Strong, whose talent for photography has won his many awards.

Allied Drive-In Convention

A number of projectionists attended the technical sessions and exhibits at the second annual National Allied Drive-In Theatre Convention held earlier this month at the Chase Hotel in St. Louis.

This gathering, which examines the many problems of the fast-growing drive-in industry, is becoming increasingly important. Among exhibitors this year were Altec Service Co., Hertner Electric, Motiograph, National Theatre Supply, Projection Optics, J. E. Robin, and The Strong Electric Corp.

LETTERS TO THE EDITOR

The appended commentary from a practical projectionist points up a very pressing problem, the solution of which, IP hopes, is also included.

LATELY I have had considerable trouble with CinemaScope prints damaged as indicated on the enclosed samples from *all* six reels. I believe that this damage is caused when the slack was not taken up by the top spindle, which is similar to the quick-start RCA action on the bottom sprocket when the lower spindle was not tight enough.

Once this difficulty ensues, and the section of film is not taken out, the film will slip a couple of sprocket teeth in the magnetic pickup — which requires a complete stoppage to take up this slack.

It requires only a little better care on the part of all concerned to prevent this damage, thus the reason for my directing your attention to this matter.

ALBERT H. FEGAN
IA Local 428, Stockton, California.

From 20th Century-Fox comes this interesting commentary.

Mr. Fegan is quite right. The leader damage is the result of fast takeups, small-cored reels, and carelessness in leaving slack in the upper magazine. If all projectionists were as careful as Mr. Fegan seems to be, we would have much less leader replacement in our exchanges.

Equipment-wise, using the large-hub reels with proper hold-back and takeup tensions, and motors of reasonable acceleration, will go a long way toward correcting this trouble. This assumes, of course, that the projectionist takes out the slack film when he threads-up, and also that the sprocket teeth are in good condition.

On our part, we are alerting all our exchanges to replace the damaged leaders.

From IP's corner the following:

The nuisance of torn perforations in leaders is by no means confined to CinemaScope magnetic-sound film prints. While performation damage is more prevalent with this type of print, because of the greater "tearing action" of the somewhat smaller CinemaScope sprocket teeth, the trouble which forms the basis of Mr. Fegan's complaint has been with us ever since Nickelodeon days.

Mr. Fegan has correctly pin-pointed the source of leader damage — the failure to take up the slack in the film between top reel and upper sprocket (or CinemaScope penthouse reproducer) and between lower sprocket and bottom reel. Please, fellows, remove this slack before switching on the projector motor!

Another Important Factor

There is one other cause of torn leader sprocket-holes to be considered. When the slack in the film between the optical soundhead and lower reel is taken up, too vigorous turning of the reel may bring the film up tight with a snap. And what usually happens? The teeth of the hold-back sprocket of the optical soundhead rip through the perforations.

This frequent source of leader damage can be avoided by holding the film firmly between thumb and forefinger of the left hand at a point just below the hold-back sprocket. Then, when the lower reel is given a spin, the film does not tighten up directly against the sprocket teeth.

Projectionist Aid Solicited

To the Editor of IP:

IP first came to me in Australia in 1929, and it has followed me to 30 countries since then. Your articles have always excited intense interest on my part.

As a manufacturer and distributor of projection equipment for many years, I have come to value and respect the opinions of the projectionist craft. I think that at the moment one of the most pressing projection problems is power supply for the larger arclamps needed for big-screen picture presentations in both indoor and drive-in operations. To this end I solicit the suggestion of projectionists as to any refinement which will contribute to greater ease of operation and more durability for such units.

M. D. FAIGE
Norpat Sales, 113 W. 42nd St., N. Y. City

V-V "Squeezed" Prints

To the Editor of IP:

In the December last issue of IP on page 12 there appeared an article by Loren Ryder which announced that Paramount would have anamorphic squeezed prints for any theatre which desired to use them. When we asked for such a print of "White Christmas," the Paramount exchange in Indianapolis informed us that Par did not make such prints.

Please check on this matter for us. We enjoy the wonderful articles appearing in IP.

A. M. AND G. FORD
Carmel Theatre, Carmel, Indiana

The reply to the foregoing is by Loren L. Ryder, Head of Engineering and Recording for Paramount Studios, Hollywood:

There has been no change in Paramount policy. Anamorphic prints will be made available on our VistaVision pictures for use in theatres where such prints can prove of value. Such prints will be prepared as soon as all the necessary transfer and printing lenses are in operation. Paramount exchanges will be advised at that time.

IP Kudo From India

To the Editor of IP:

Many of our projectionists in India are almost totally unaware of the construction and operating details relative to the various new film processes introduced within the past two years, because they have no access to the requisite literature.

I personally am in the fortunate position of having become aware of IP, and I may say that this is the only medium through which I have been able to keep abreast of all these new developments. I enjoy projection work, but I should have been seriously handicapped were it not for the invaluable information I received through your magazine.

V. S. JOSHI
Dadar, Bombay 28, India

BUY U. S. SAVINGS BONDS

In The
SPOTLIGHT

The function of this department is to provide a forum for the exchange of news and views relative to individual and group activities by members of the organized projectionist craft and its affiliates. Contributions relative to technical and social phases of craft activity are invited.

Buttressing IP's oft-repeated declaration that the so-called "transitory" phase through which the motion picture industry is now passing is basically a technological revolution is the appended official statement by Dr. John Frayne, director of engineering for Westrex Corp. on the recording end in Hollywood, and president of the SMPTE:

DR. JOHN G. FRAYNE, announced the Society's plan to establish a committee to look in to the problem of the growing need for *trained technical people* in the motion picture industry.

Dr. Frayne explained that the motion picture industry is becoming more and more *technical,* and that work that once could be done by unskilled people is now too complicated and requires the skill of trained personnel. Realizing this, and the ever-increasing need for trained people to replace present skilled personnel who are approaching retirement age, the Board of Governors of the Society, recommended that Dr. Frayne appoint a committee to look into the situation and recommend ways in which they could aid in building a reserve of technically-minded manpower.

The committee, which will include people from all phases of the industry, will attempt to determine where the need for more people with better technical education is greatest.

Evidence of wide-spread industry acceptance of the foregoing, is the following excerpt from an editorial by Chester A. Bahn, editor of the "Film Daily," which is primarily concerned with distribution and exhibitor interests.

Events of the last two years certainly have established beyond the shadow of a doubt that the future of this industry rests firmly on its ability to progress technically, and at a steady rate. Our previous policy—if it can be called that! —of stirring into action only when a crisis arises has cost us a pretty sum, not in pennies but in millions.

Further comment anent the foregoing by this department would be superfluous.

• IP views with considerable satisfaction the successful joint endeavor by Wisconsin Locals 606 (Wausau) and 722 (Wisconsin Rapids) in their fight to maintain the two-men-per-shift projection crews at the Fox and Lyric Theatres in Stevens Point, Wis. This item is deliberately positioned here so that it may provide immediate contrast with the preceding article relating to the urgent need for technological know-how.

In IP's book technological know-how has always been translated in terms of adequate manpower, therefore it comes as somewhat of a shock to this department to hear the recent anguished outcries of exhibitors who wish to introduce new and complicated processes and at the same time *reduce* the manpower in the projection room necessary to obtain the best results.

IA Locals 606 and 722 fought and won the battle for the maintenance of adequate manpower on the basis of public safety and theatre construction (non-fire proof). Also introduced in the Local's argument before the City Council at Stevens Point, where the hearings were held, was the relative degree of "safety" as between acetate and nitrate film.

Safety Film Characteristics

While IP recognizes the basic safety advantages stemming from the use of acetate film, it may not in all candor be denied that this film base when subjected to the present high-intensity light sources will buckle and probably curl. Slow burning though this acetate base be, the fact remains that its instantaneous decomposition under the withering rays of present-day arclamp light sources will be visually apparent via the screen image

GENE ATKINSON, LOCAL 110, HONORED BY SISTER LOCAL

Eugene Atkinson (second from left), business representative for Chicago Local 110, receives a gold honorary life membership card in Film Laboratory Technicians Local 780, Chicago. Arthur W. Beeman (second from right), business representative for Local 760, made the award on behalf of the Local in recognition of the invaluable services rendered by Atkinson in building it from a mere handful of members when it was founded ten years ago, to its present status as a thriving IA Local with jurisdiction in the central United States from the Canadian border to the Gulf of Mexico. Atkinson served as a voluntary business representative for the Technicians' Local during its infancy, negotiating contracts and acting in an advisory capacity. Witnessing the presentation are Clarence Jalas (extreme left), secretary-treasurer of Local 110, and Walter Vance, member of Local 780.

to the audience. This being so, and it is, the element of danger resulting from panic in the audience still is ever present.

Summaries of recent appeals to civic authorities which have resulted in a reduction in projection room manpower have left this department a little woozy, for the reasons aforementioned. In such situations there is absolutely no sense in appealing to the exhibitors' state of mind for best presentation results; they'll have none of it.

Appearing for Local 606 were Woodward Bierbrauer, business representative; Lawrence Jacobson, vice-president; Lawrence Goodnow, secretary-treasurer, and attorney Herman J. Glinski. George Jacobson, business representative, appeared for Local 722.

Merle Chamberlin, projection supervisor, M-G-M Studios

• Merle Chamberlin, member of Hollywood Local 165 and projection supervisor at the M-G-M Studios, Culver City, Calif., was recently elected president of the M-G-M Studio Club. Dore Schary and E. J. Mannix are among the studio personnel serving on the newly-elected board of governors. Speaking for the board, Chamberlin stated that a new and enlarged program of service to the Club members was its goal and he urged the members to present their ideas or suggestions for improved services of the various committees.

• The annual mid-winter meeting of the IA General Executive Board was held at the Royal Connaught Hotel in Hamilton, Ont., Canada the week of February 14.

• One of the out-of-town visitors to the offices of IP last month was Roy Fisher, member of Rochester Local 253, who made a special trip to our city to attend the installation of officers of the 25-30 Club. Fisher, who developed and manufactures the popular Ethyloid film cement, as well as other projection room items, reported that business was booming. Fisher has retired from projection work and is devoting all his time to his flourishing business.

• As the result of a recent election conducted by the NLRB, Cameramens Local 644, IATSE, was chosen as the bargaining agent by film cameramen of the Columbia Broadcasting System in the New York area. Previously representing cameramen of all other networks, the IA two years ago signed a national contract with CBS, but this could not apply to the New York group inasmuch as it was already under contract as part of a Tv engineering unit represented by the IBEW. However, upon the expiration of the IBEW contract last May, Local 644, assisted by the International general office petitioned the NLRB to establish a separate voting unit for film cameramen, sound men, and lighting men at CBS. The Board, finding that the work of this group was "separate and functionally distinct" from that of Tv engineers, granted this request and ordered the election which resulted in an IA victory.

• Two IA men, Murray J. Nugent and Lawrence Sabatino, members of Local 650, Westchester Co., N. Y., were elected officers of the Westchester County Federation of Labor. Nugent was elected trustee and Sabatino will serve as financial secretary-treasurer for a two-year period.

Lawrence Sabatino

Murray Nugent

• The Georgas Brothers, Jim and Bill, members of Toronto, Local 173, have become almost lengendary in Canadian skiing circles by their trophy-winning feats. At the first major ski meet of the winter, which was sponsored by the Huntsville Ski Club (Ont.) last month, Jim Georgas won practically every contest. He won the four-way championship for the second year in a row as the meet's best all-around skier. He also won by wide margins the Nordic (jumping and cross-country) combined, and the Alpine (downhill and slalom) combined. In addition, he won the slalom race through a minor blizzard in the afternoon meet, and placed second in the downhill and cross-country.

Jim Georgas plans to retire from competitive skiing at the end of the ski season and join his brothers in teaching the sport to youngsters—that is, unless he is chosen for the

CELEBRANTS AT BRANTFORD, ONT. LOCAL 582 ANNIVERSARY

More than 100 people attended the dinner-dance tendered by Local 582, Brantford, Ont., Canada, in the Coronation Room of the Brant Hotel in that city in commemoration of the Local's 35th anniversary. Shown above, left to right, are some of the personages attending the event: Charles Ward, alderman of the city of Brantford; Lon Tyler, Local 582 president; Hugh J. Sedgwick, IA fifth vice-president; Reg. Truckle, the only remaining charter member of the Local, and Lou Lodge, secretary of District No. 11 and of Toronto Local 173.

Olympic ski team. "If I can make the Olympic," he said, "then I'll know I'm still good enough to beat the best in the country."

• Local 337, Utica, N. Y. recently concluded negotiations with the Kallet Theatres in Utica, and signed new three-year contracts calling for a 3% increase in wages for its members for the first year, and an additional 3% for each of the following two years. Among the benefits covered in the new contracts are two weeks vacation with pay for all projectionists, and time-and-a-half for overtime. The Local also signed a new contract with Warner Bros. Theatres, obtaining a 15% increase extending over a five-year period, plus paid vacations and time-and-a-half for overtime.

Harry Lackey, business representative for Local 337, served as chairman of the wage committee negotiating the contracts and was ably assisted by John Stuczko. Lackey reported that Utica is now 100% organized.

• Frank Pircher, veteran member of Local 306, retired last month from his job as projectionist at Loew's Victoria Theatre in New York City, where he worked for the past 27 years.

When asked what he planned to do upon his retirement, Pircher stated that he hoped to spend a great deal of his time studying the classics. "All my life I have either been studying or working in the fields of science or engineering," said Pircher, " and I somehow have the feeling that scientific progress is coming so fast that we have not had time to adjust ourselves to it. That is why I should like to read about the ideas of men who lived in the past when people were closer to reality." The re-reading of Shakespeare's plays and the works of Voltaire and Walt Whitman are also part of Pircher's program of study.

Frank Pircher came to this country from Austria as a lad of 14. He attended Cooper Union in New York City and was graduated in the early 1900's with a degree of Bachelor of Science in Electrical Engineering. Shortly thereafter he worked for the Consolidated Edison Co. of N. Y. as a supervising engineer. This was the era when electricity was coming into wide use in both industry and the home. Power lines often proved inadequate for the loads they had to carry. For instance, very often when a projectionist struck the arc in one of the early lamps, the lights in neighboring stores would go out. It

Frank Pircher, member of Local 306, New York City

was Pircher's job to trace the source of the trouble and to remedy it. Eventually he became interested in motion pictures and shortly after World War I he joined Local 306 and got his first job as a projectionist, working steadily at the craft until his retirement.

More agile than a far younger man, Pircher looks much younger than his 78 years. Climbing up to the almost inaccessible projection room at the big Loew's Victoria Theatre, which can be entered only by the climbing of stairs, steel ladders, and crossing a catwalk between the ceiling and the roof of the theatre, taxes the efforts of much younger men but to Pircher it was all part of the daily routine and he took it in his stride.

• The 25-30 Club held its annual installation and banquet last month with the usual large turnout. Many members and guests from out-of-town, including representatives from leading projection equipment manufacturers, were present at the affair.

After the installation ceremonies, the Club presented gifts to several of its officials for service rendered during the past year. Abraham Kessler, the outgoing president, was presented with an oil portrait of himself. Benjamen Stern, financial secretary, received a gold pen and pencil set; Morris I. Klapholz, recording-secretary, was given two pieces of luggage, and Morris J. Rotker, who was master of ceremonies at the banquet and the installing officer, was also presented with luggage. Jacob S. Winick, the newly elected president of the Club, was presented with an ivory gavel by Ernie Lang, who made the presentation on behalf of the Projectionists Square Club. Souvenirs of Paper Mate pens and 1955 pocket diaries were distributed to the guests.

Among the honored guests were Arthur Meyer, International Projector Corp.; Allen G. Smith, National Theatre Supply; Arthur Hatch, Strong Electric Corp.; Paul Reis, National Carbon Co.; Mike Springer, for RCA, and Joe Hornstein, Jr., of the Hornstein Theatre Supply. Out-of-town members included Roy Fisher, Local 253, Rochester; Harry Lackey, Utica Local 337; Edward LaBadie, Syracuse Local 376; Al DeTitta, Ed Dougherty, John Coutolli, Ralph DeMea, and Tony Boscorelli, members of Local 384, Hudson County, N. J. New York Local 306 was represented by a delegation including Ernie Lang, Izzy Schwartz, Al Kunze, Steve DeInzillo, Harry Garfman, and Charles F. Eichhorn.

IP was represented by James J. Finn, editor, and James Morris, associate editor.

IA OBITUARIES

JULIAN ANTHONY, 67, veteran member of St. Louis Local 143, died of a heart attack last month. He joined the Local in 1915 and worked in many of the theatres in and around St. Louis. His son, Norman, also a member of the Local, survives him.

CARROLL G. BAYNE, 66, business representative for Baltimore Local 181 for the past 8 years, died recently. A member of Local 181 since 1912, he worked at the Stanley Theatre in Baltimore for 26 years. He was a delegate for many years to the Baltimore Federation of Labor and also represented the Local at IA Conventions. He was active politically, being associated with the Democratic organization in his district. Carroll Bayne was a veteran of World War I, serving in the U. S. Navy. He was buried in the National Cemetery in Baltimore.

New Victor AC Offices in N. Y.

Victor Animatograph Corp., with home offices in Davenport, Iowa, announces that increased sales, manufacturing and export activities its New York City offices have been moved to larger quarters at 200 West 57th St. and there consolidated with its Latin American division. Horace Jones, vice-president, is in charge.

More CinemaScope for Britain

There are now more than 500 CinemaScope installations in England, and these installations will soon equal those in the United States in the ratio of CinemaScope-equipped theatres and population. So announces 20th Century-Fox.

New Cinerama Feature Opens in N.Y.

THE new Cinerama feature, "Cinerama Holiday," opened in New York this month with both film critics and public registering enthusiastic approval. The new feature differs from the first Cinerama production in that it is not a series of unrelated scenes. All of the sequences are tied together by making it an account of the travels of two young couples on vacation.

Since the technology of the three-projector Cinerama system is well known and has not been altered in any important way for this new presentation, an account of the projection details need not be repeated. Appended are the comments of Bosley Crowther, eminent film critic of the *New York Times*:

"As with the first bill, '*This Is Cinerama*,' the present program is essentially a show of exciting and colorful outdoor action incidents and grand scenic spectacles. Only this time the hodge-podge of material is strung on the wisp of a story line, which has the incidents and spectacles encountered as the experiences of two sight-seeing couples, one traveling in the United States and the other traveling abroad . . . The second half of the program is picked up with a thrilling, climactic sequence, taken from the cockpits of jet fighter planes doing aerial acrobatics and landing on an aircraft carrier's deck.

"By far the most dazzling experiences visualized on the giant screen—once the Cinerama spectacle is opened with a breath-taking airplane view of Alpine terrain—are some grand and exhilarating moments of skiing and a heart-thumping plunge aboard a bobsled. This latter episode with its accompaniment of sounds of screaming runners and rushing wind is something to put the new familiar roller-coaster ride of '*This Is Cinerama*' in the shade.

Improved Technique Apparent

"From the point of technical perfection, '*Cinerama Holiday*' manifests many improvements over the initial program. The cameras are much more mobile, giving a greater flexibility and fluidity to the action scenes, and more freedom at 'panning' and cutting makes for a smoother cinematic flow. While overlapping within the giant panel of the images thrown by the three projectors is evident at times, the synchronization of the composite image is generally improved.

"To be sure, the giant screen still looks distorted to those sitting in the outer fringe of seats, but the optical experience is still novel, however foreshortened and bizarre.

"Conglomerate and random though it may be, '*Cinerama Holiday*' is a dandy show."

New Ampex Sound System for All Theatre Needs

A theater sound system capable of reproducing CinemaScope magnetic stereophonic sound, single-track magnetic sound, single-track optical sound and Perspecta Sound is now being marketed by Ampex Corp., Redwood City, Calif.

In announcing the availability of the combined optical—magnetic system, Jim Mahon, theater equipment sales manager, said the price for a complete system, including all facilities for three-track CinemaScope sound, was about equal to the cost of simply replacing the aging, single track optical sound systems still used in many theaters.

"For little more than what he spends in replacing worn-out optical sound equipment with modern high-fidelity amplifiers and speakers, the theatre owner can now have facilities for playing every type soundtrack in existence," Mahon said. "The new Ampex optical-magnetic system replaces all sound equipment currently in the projection room except the optical soundheads and the power supplies for the p.e. cells."

Perspecta Integrator Available

As supplied by Ampex, unless specially ordered, the system does not include the integrator needed for Perspecta sound. However, complete switching facilities for Perspecta are provided so that only the addition of the integrator is necessary. The integrator is available from Ampex at extra cost.

A single box mounted on the front wall of the projection room provides facilities for selecting magnetic, optical, Perspecta or phonograph sound; for changeover between projectors, and for controlling sound volume.

Are You Moving?

Are you planning to change your address? If so, please notify our circulation department one month in advance. The Post Office does not forward magazines mailed to a wrong address. To avoid confusion and delay, please cooperate by sending us both your *new* and your *old* address.

RCA Has Record Income Year

RCA did the largest volume of business in its history during 1954. RCA manufactures a full line of both 35- and 16-mm projectors and sound equipment in addition to theatre Tv equipment, Tv sets and other electronic products. It also owns the NBC Tv network.

Sales of products and services by RCA in 1954 amounted to approximately $930,000,000. Net profit before federal income taxes will be approximately $84,000,000 and after taxes approximately $40,000,000. The 1953 gross of the company was $853,054,000. Net profit was $72,437,000 before taxes, and was $35,022,000 after taxes.

Major Developments in 1954

Listed as major developments during 1954 were compatible color Tv, the RCA 21-inch color tube and a new Tv color receiver using it, the RCA magnetic Tv tape recorder, electronic light, electronic light amplifier, transistors and high fidelity record players.

The 1955 production of Tv receivers is estimated at 6,000,000, increasing the total number in the U. S. to about 38,000,000 by the end of the year.

At the opening of 1955, there will be more than 420 Tv stations in operation in the U. S., 140 of which will be equipped to handle network color programs. More than 90 new Tv stations began operating in this country during 1954. In Canada, 26 Tv stations are expected to be on the air by early 1955.

Portent of Progress?

Century Circuit of N. Y. City, one of the largest in the nation, reports that its business is better by far this year than in 1953. Improvements in business is attributed by circuit executives to fine factors as follows:

1—Better pictures.

2—Ticket tax relief.

3—Income tax cut, which makes more spending money available to the public.

4—Technological advances, which have caused "tremendous talk" and revived public interest in motion pictures.

5—"The magic of Tv has worn off." Says Century: "in the long run Tv will do more than anything else to help the industry."

PERSONAL NOTES

HANS TIESLER, for the past three years associate producer for Loucks & Norling Studios, N. Y. City, has been elected vice-president and a director of the company, it is announced by John A. Norling, president. Tiesler succeeds Will Marcus, who has resigned his executive position but will retain connection with the company on a consulting basis.

The company, founded in 1924, has a score of technical "firsts" to its credit, including the famed 3-D "Audiscopics" of 25 years ago. It now produces films for industrial and television purposes.

R. D. FAIRBANKS, who has been with Altec since 1937 and lately an engineering specialist at their Boston northeastern office, has been transferred to Altec's New York headquarters to carry out a special assignment in connection with a classified electronics project for the U. S. Navy.

A saga of American industrial life was written recently when two erstwhile messenger boys were named to top executive posts of a bell-weather and internationally-known business enterprise. The company—Bausch & Lomb Optical Co.; the men—CARL S. HALLAUER, newly-elected president of the company, and his predecessor, JOSEPH F. TAYLOR, who is now chairman of the board.

Carl Hallauer (left) president, and Joseph F. Taylor, chairman of the board, of Bausch & Lomb Optical Co.

Mr. Hallauer, who started his business career as a newsboy when he was orphaned at the age of nine, has been executive vice-president of B & L since 1952. He joined the firm as industrial relations director in 1918. He is also president of Bausch & Lomb, Ltd. of Canada, and Bausch & Lomb do Brasil Ltd., the firm's South American subsidiary.

Mr. Taylor, president of the company since 1949, began his career with the company in 1910 as an errand boy. M. HERBERT EISENHART, former board chairman, was named honorary chairman.

J. F. ("JACK") O'BRIEN, widely known throughout the theatre equipment field during his 24-year career with RCA, has been appointed manager of the Theatre and Industrial Marketing Department of the company's Engineering Products Division. He succeeds George L. McKenna, resigned.

For the past several years manager of RCA Theatre Equipment, with headquarters in Camden, N. J., O'Brien now assumes responsibility for the products planning, marketing and sales of RCA theatre products, industrial and scientific equipment, film-recording apparatus, sound equipment and "Tv Eye" closed-circuit industrial Tv systems.

O'Brien joined RCA in 1931 and has served as field sales representative in such important markets as Hollywood, St. Louis, Chicago and Boston. In 1951 he was advanced to sales manager. A native of Buffalo, N. Y., he is a New York University alumnus.

HAROLD BROWN has been named vice-president in charge of sales for The Strong Electric Corp., Toledo, Ohio. Mr.

Harold E. Brown, v-p in charge of sales for The Strong Electric Corp.

Brown joined the Strong organization in 1935 after a tour of duty with General Electric. He will be in charge of sales of projection arclamps, rectifiers, spotlamps, slide projectors, and reflectors.

Improved Optics, Light Output For Strong "135" Lamp

The Strong Electric Corp. has announced that its Super "135" projection arclamp, equipped with an 18-inch diameter F/1.7 reflector, will be available to theatres with F/1.8, F/1.7, or F/1.5 objective systems and projectors cleared these high-speed optical systems. The Super 135 lamps will also continue to be offered with a 16½-inch diameter F/1.9 reflector.

With this 18-inch diameter F/1.7 reflector and matching high-speed objective lens system, a total of 31,000 lumens can be projected through a standard 0.825 X 0.600 aperture, or 38,000 lumens through a CinemaScope magnetic sound aperture, using 10-mm Hitex carbons at 135 amperes. This light output is asserted by Strong to be the highest that can be presently attained for big-screen presentations.

Improved Carbon Contact

All Super 135 lamps, with either size reflector, will be available for 9-, 10- or 11-mm regular trims as well as 10-mm Hitex operation and will feature an improved positive carbon contact that has proved outstanding in life tests in several "grind" houses. Hereafter they will also be equipped with a new ventilated reflector frame to insure cool operation of the reflector and rear section of the lamp even at extreme angles of projection.

Special Blower Cooling Fan

Simultaneously with this announcement, Strong also stated that all future Super 135 lamps will be provided with a special blower fan for keeping the Strong Infra Ban Beam Cooler at a lower operating temperature by removing the light energy which is neither reflected nor transmitted but is trapped in the filter itself.

This beam cooler and blower will provide improved means for removing and dissipating the unwanted portions of energy from the light beam before it reaches the aperture. These new model lamps will also have the filter mounted on a removable holder for quick removal and ease of cleaning.

"Camera Talk" Photo Bulletin

"Camera Talk" is a breezy, informative little publication now being published by Camera Equipment Co., 1600 Broadway, New York City, 19. Designed expressly for all those interested in photography, whether professional or amateur, this booklet which is published at regular intervals contains valuable data on both equipment and technique.

"Camera Talk" will be sent free of charge to anyone in the industry upon application to CE.

Electronic Synthetic Music

An electronic music synthesizer, capable of generating tones beyond the range of a voice or an instrument, has been developed in RCA experimental laboratories. The device makes it possible, for instance, to simulate an entire orchestra by pressing typewriter-like keys that actuate electron tubes and transistors.

50% Jump in Loew Profits

The 50th anniversary report of Loew's, Inc. and its theatre subsidiaries showed a net profit of $6,577,311 for the fiscal year ended Aug. 31, 1954. This is an increase of $2,196,707, or 50%, over the previous year.

An interim financial statement sent to stockholders with the annual report shows that for 12 weeks ended Nov. 25, 1954, the net of Loew's and all subsidiaries amounted to $1,521,349 after all taxes and charges, subject to year-end adjustment. This is equivalent to 30 cents per share, compared with $1,133,893, or 22 cents per share, for the same period of the preceding year.

Profit before taxes for the 1954 fiscal year was $12,643,840, compared with $6,435,504 in the previous year. Operating revenues were $183,142,486, compared with $177,588,874 in 1953.

New U-I Release in 3-D

Any theatres interested in giving 3-D another chance will soon have an opportunity. Universal-International announces that they will have dual prints available for two-projector 3-D presentation of the feature, "Revenge of the Creature," now being released. The picture can be shown either "flat" or in 3-D, as desired.

1A ELECTIONS

LOCAL 304, WATERBURY, CONN.

Thomas Gandy, *pres.*; Joseph Mazeika, *vice-pres.*; Frank Carey, *sec.-treas.*; Francis LaFalmme, *corr.-sec.*; Ralph Di Pietro, *bus. rep.*; Harold Berger, *sgt.-at-arms.*

LOCAL 380, OKLAHOMA CITY, OKLA.

Bert Bell, *pres.*; W. R. White, *vice-pres.*; Berlin Parks, *sec.*; Kenneth Lyons, *bus. rep.*; R. G. Boyer, *sgt.-at-arms*; Omar Woodard, Verne Thorne, and Floyd Harcum, *trustees.*

LOCAL 332, CLINTON, IOWA

Harold Andrews, *pres.*; Charles Tintey, *vice-pres.*; A. E. Hubbard, *sec.-treas.*; Paul Nadelhoffer, *bus. rep.*; Ronald Dierks, *sgt.-at-arms*, and Charles Snyder, *trustee.*

LOCAL 407, SAN ANTONIO, TEX.

Genaro G. Garcia, *pres.*; Alfred Pena, *vice-pres.*; Henry Villapadierna, *sec.-treas.*; Horace E. Blanton, *rec.-sec.*; John D. Dennis, *bus. rep.*; Phillip N. Wehrmann, Manuel Ayala, *members at large*; Manuel Perales, J. W. Good, and Joe Sanches, *trustees.*

LOCAL 414, WICHITA, KANS.

H. I. Phillips, *pres.*; Benton E. Swart, *vice-pres.*; Edward J. Storey, *sec.*; C. H. Winslow, *treas.*; E. L. Jeffress, *bus. rep.*; M. L. Geiger, *sgt.-at-arms.*

SUPER SNAPLITE
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and
SUPER SNAPLITE
f/1.7X

(True speed of f/1.7 in all sizes where fast lenses are needed)

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From Kollmorgen . . . the newest, fastest projection lenses you can buy. To give you the brightest, clearest, sharpest, most uniform picture you have ever seen on your screen. For better Boxoffice, better patron satisfaction, better all around filming, try the SUPER SNAPLITE f/1.7. Where lens mount interferes and vignetting is a problem, try the SUPER SNAPLITE f/1.7X.

True speed of f/1.7 in focal lengths from 2 inches through 4 inches in ¼ inch steps. Ask your Theatre Supply Dealer about these fine lenses. For more information ask your dealer or write for Bulletin 222.

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60-DEGREE INTERMITTENT?

(Continued from page 10)

loop. As soon as the film stops moving in the aperture, the feed sprocket begins to feed film in to rebuild the loop.

With the 2-3 timing, the rubber pad is made to move up and down about 1/16 inch so as to correspond with the two different sizes of loops. In framing, the pad also moves up and down to follow the loops.

IP Comment Upon Jackson Intermittents

THE oscillating-cam Geneva intermittent movements devised and tested by J. G. Jackson are ingenious and entirely satisfactory. Especially noteworthy is the fact that several modifications of this type of movement are possible to give almost any desired pull-down speed and "dwell" timing. Thus Jackson's intermittents lend themselves admirably to all conceivable theatre, commercial, and television applications.

A very attractive feature of these movements is, of course, the standard 4-slotted starwheel and standard 16-tooth, 35-mm sprocket. Performance should be quiet and rock-steady. Then, too, no difficulty would be encountered in adapting these movements to 16-mm applications, it being necessary only to substitute a 4-tooth, 16-mm sprocket for the 35-mm sprocket.

Worthy of Serious Study; 5:1 Especially Noteworthy

Jackson's description of these intermittents is worthy of the most serious study. To avoid confusion in visualizing the mechanical functioning, we should bear in mind that the drive gear which slides the double-faced cam back and forth makes 3 turns for each revolution of the spline shaft (Figs. 1 and 2). Thus each of the two cam pins engages a starwheel slot only once during every 2 revolutions of the cam.

The 5 to 1 movement shown in Fig. 1 represents a marvelous solution of two serious present projection problems: insufficient light in some theatres, and flicker due to too much light in others. When a 2-cutoff shutter is used with a 5 to 1 movement, the shutter blades can be trimmed down to as little as 60 degrees before travel-ghost shows up. This makes possible a light-transmission of 66.67%; whereas the maximum transmission for the ordinary 3 to 1 intermittent movement is only 50%. (To get a transmission of 71.6% with his 5:1 movement, Jackson trimmed his shutter *just a bit* beyond the theoretical limit—a small point.)

When high-powered arcs are used in small theatres, the periodic interruption of the light-beam by the rotating shutter produces a visible flicker. But Tv has accustomed the public to extremely bright pictures!

5-to-1 Movement Outstanding

This is a problem easily licked by the 5 to 1 intermittent. With this intermittent a 3-cutoff shutter may be used. The result is 72 cutoffs per second instead of the usual 48—a frequency so high that no flicker can be seen even on the brightest screens. Because each blade of the 3-blade shutter covers 60 degrees, light transmission is 50%.

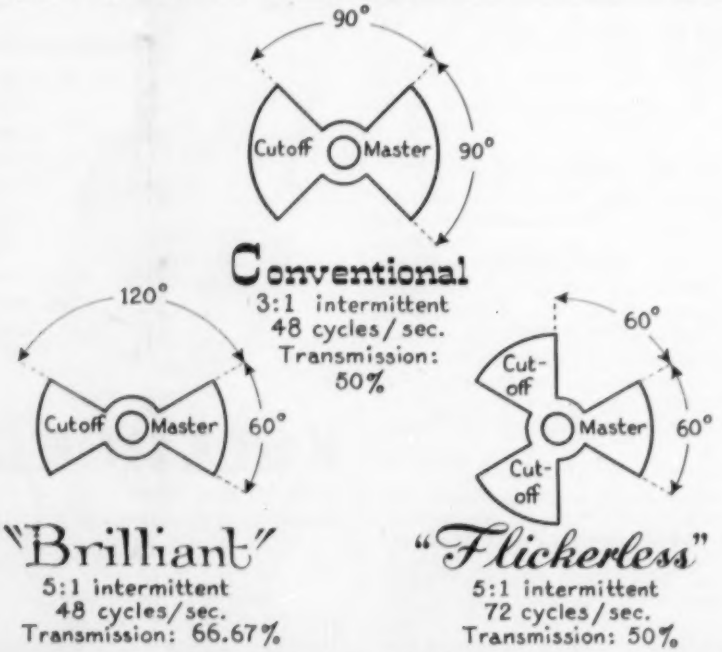
The 2-3-2-3 sequence of "dwell" periods required for Tv projection (60 fields per second) has been successfully engineered in the intermittent movements now in use in all but a few types of Tv projectors. These, whether "claw" or "sprocket" intermittents, are sometimes called "eccentric" movements in order to distinguish them from the standard "equal-rest" intermittents used in conventional optical projection.

The Jackson oscillating-cam Geneva movement shown in Fig. 2 is another mechanically sound intermittent of the eccentric type. Employing a standard 16-tooth, 35-mm intermittent sprocket, it provides a more satisfactory film-wrap and smoother transport than the 12-tooth sprocket used with the "divided pull-down," 2-pin non-oscillating cam type of eccentric intermittent. The "secret" of this intermittent lies in the slotted bracket which provides a non-uniform oscillation of the cam on the spline shaft.

Although the special slow-motion variant of Jackson's intermittent is interesting from a purely mechanical point of view, its commercial application would seem to be limited to printing machines.

Numerous Possibilities Seen; Film Pull-Down and Tension

The variations described by no means exhaust the possibilities of



The two-fold advantage in shutters which can be used with 5-to-1 intermittent movements. The "Brilliant" shutter has the same periodicity as the conventional shutter—48 cycles per second—but transmits much more light to the screen, making the picture brighter. The "Flickerless" shutter transmits the same amount of light as the conventional one, but its high frequency—72 cycles per second—frees pictures projected at high light levels from annoying shutter-flicker evident with intense light at 48 cycles per second.

Jackson's basic idea. By employing a 2 to 1 drive-gear ratio and only one pin in the oscillating cam, every 2 revolutions of the cam would give only 1 film pull-down. Thus modified, the movement diagrammed in Fig. 1 would operate at a 7 to 1 instead of a 5 to 1 pull-down ratio. A pull-down of even this great rapidity would be practical, permitting a light-transmission of 75% with a 2-cutoff shutter system (blades 45 degrees wide), or 62.5% with a 3-cutoff shutter for flickerless movies at even the highest light levels.

Film Pull-Down Ratio

Increased pull-down speed requires greater tension on the film in the gate to prevent overshooting, of course, and increased tension shortens the life of the film. It has been established, however, that a pull-down ratio as high as 8 to 1 can be used in 35-mm projection without reducing the life of release prints to such an extent that they would wear out before having served the normal number of runs.

The use of a sponge-rubber pad under the upper film-loop to prevent overshooting does not seem to be the best solution of an admittedly difficult problem. We are willing to accept Jackson's statement that the rubber stop works; but we can't help wondering if it causes excessive noise, produces unsteadiness of the image, or increases the likelihood of film breaks, especially if not positioned with extreme accuracy. Operation might be considerably simplified by eliminating the rubber stop and increasing gate tension.

Jackson's intermittent variations are devices of real merit and practicability. They are eminently worthy of the most serious consideration by all serious projection practitioners who are aware of the limitations of the ordinary 3 to 1 movement and of the demands of the times.

Par's VistaVision Print Projection Framing Index

Coincident with the release of the feature films "The Bridges at Toko-Ri" and "Three Ring Circus," Paramount is including a projection framing index card on the thread-up reel. All Paramount pictures are in the VistaVision process with Perspecta optical sound track.

Vebatim content of this framing index is as follows:

To assist projectionists in the proper framing of VistaVision prints Paramount has placed a framing index on each "A" (or thread-up) reel of the release print.

This framing index appears briefly twice in the upper right-hand corner of the projected image, first 12 feet after the start of the reel for 12 consecutive frames, and again 8 feet after the first appearance for 14 consecutive frames. On the screen, the symbol will look like this:

(1.66-1.75-1.85) —
— **(2.00)**

When the upper horizontal line extending to the LEFT is framed right to the top screen masking, the picture will be framed for 1.66-to-1, 1.75-to-1 or 1.85-to-1 aspect ratios. When the lower horizontal line extending to the RIGHT is framed to the top screen masking, the picture will be properly framed for a 2-to-1 aspect ratio.

As a further guide to the projectionist, each frame of the head leader of "A" (or thread-up) reels will carry a black rectangle, precisely placed to provide the proper head-room for the projected image in aspect ratios of 1.66-to-1, 1.75-to-1, and 1.85-to-1. The projectionist merely inserts in his projector an aperture plate in the desired ratio, and adjusts his frame control to center this black rectangle in the aperture when threading up. When the framing index appears on the projected image, he can check the framing and make such further minor adjustment as is required.

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Eidophor Demonstration Near

A demonstration of the Eidophor system of theatre Tv is expected shortly, according to 20th Century-Fox engineers working on this Swiss system which is capable of filling a wide screen with both color and black-and-white pictures. They believe that they have eliminated a flicker problem which was holding up development.

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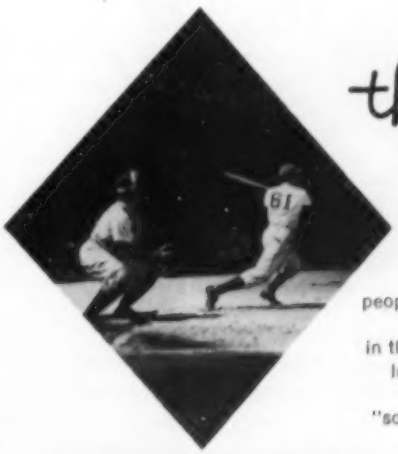

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Large-Core Lorraine Carbons

Because of the increasing need for more projection light and in anticipation of much larger apertures, Lorraine laboratories have begun enlarging the core area of their Orlux carbons.

While it is true that optical systems of present projection lamps are designed to have specific magnifications and speed, a large core area makes it possible to get the attainable quality of light even with this magnification of the arc, and in the newer lamps with faster optics the magnification of the action of the combustion of gases, taking place in the arc, is less prone to be discernable on the screen with a large core than with a small-core carbon.

Orlux carbons are now available with enlarged core area for purposes of greater coverage and steady brilliance in association with larger apertures, whether copper-coated carbons or the black 9-mm, 10-mm and 11-mm positive carbons are used, as well as with condenser lamps using the 13.6-mm positive trim. However, the full value of the large-core carbons will be realized only with the newer projection lamps that are being planned.

Tv's Effect on Ontario Biz

With the number of Tv sets in homes constantly rising, theatres in Ontario, Canada, have experienced an appreciable decline in boxoffice receipts in the years since 1951, with latest figures on yearly ticket sales showing a decline of 3,648,192 or 4% since 1951 despite a population gain of 20%.

In the areas of the province directly affected by the operation of Tv stations, admissions have declined even more sharply. In 242 theatres for which attendance figures are obtainable and which are located in Tv areas, there has been a drop in attendance between 1951 and 1954 of 11,219,868, or almost 21%.

Record Income for Universal

Record income and the highest net profit since 1946 has been reported by Universal Pictures Co. for the fiscal year ended Oct. 30, 1954. Film rentals and sales during this period brought $77,887,688. This is the highest sales volume in the company's history and compares with a volume of $70,490,254 for the preceding 12-month period.

Net profit for the 12 months ended Oct. 30 was $3,797,688, or $3.58 per share, compared with $2,616,356, or $2.35 per share, in the previous year.

Toll-Tv Opposition Organized

A committee of nationally-known exhibitors was formed recently to oppose strenuously attempts of various toll-Tv outfits to obtain approval from the Federal Communications Commission for their methods of collecting fees from home Tv owners for certain shows.

In a joint statement by Alfred Starr and Trueman Rembusch, co-chairman of the committee, it was declared that "the inherent fallacies in the arguments of the sponsors of toll-Tv must be exposed . . . The public must be informed that toll-Tv is economically unsound, that it will deprive the public of free Tv, and that it will create what is in effect a government-sponsored monopoly."

The exhibitor committee is raising $150,000 for the campaign.

Navy Buying Wide Screens

The U. S. Navy and Marine Corps. expect to install wide screens in all of their theatres during 1955 or else cease operations in theatres that can't be so converted. The Bureau of Ships has instituted a $400,000 wide-screen conversion program. Theatres for which funds are not allocated will be ordered closed.

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SMPTE Engineers to Attend Stockholm Standards Meet

In a move to assist world-wide adoption of standards for pictures made for the wide screen, the Society of Motion Picture and Television Engineers is sending a delegation to the meeting of the International Standards Organization in Stockholm next June, it was reported this month by Dr. John G. Frayne, president of the SMPTE.

The SMPTE party will be headed by Axel Jensen of Bell Laboratories. Henry Kogel, staff engineer of the SMPTE, will also make the trip. Jensen said that this attempt at coordination could be of great benefit to American film companies doing business abroad. The standards aimed at would apply to sprocket holes, film width, and soundtracks, for instance.

Other business at the SMPTE board meeting included formation of a committee to look into ways and means of improving the educational standards of people preparing for technical jobs in the motion picture business. This would probably involve working closely with schools, colleges and industry groups, including unions, to provide better training facilities.

Stanley Warner Profits Double

The Stanley Warner theatre chain has announced a net profit for the first quarter of its present fiscal year that is *more than double* that of the same period in the previous year. The net after all charges was $1,110,100, equivalent to 50 cents per share of 2,212,900 shares of common stock. This compares with a net of $523,100, or 21 cents a share, for the previous year.

The gross income for this first fiscal quarter, ending November 27, 1954, was $23,320,400. For the previous first quarter, the gross was $13,794,100. The higher earnings in the latter period are partly attributed to the operations of International Latex Corp., a garment manufacturing firm that Stanley Warner acquired as part of an investment diversification program.

Box-Office Lag Traced

The attractiveness of surrounding shopping areas was linked to the prosperity of motion picture theatres in a recent survey made by the Sindlinger organization, a research firm which specializes in the firm exhibition business.

Invited to make a survey in a small Texas town, Bonham, with three theatres and a population of 7,000, where the theatres found business slow despite investments for the new projection processes and air conditioning, the research firm found that the town's entire shopping and entertainment area was suffering from the fact that stores were generally backward and drab. Many potential customers were going to stores and theatres in neighboring towns.

Subscription Tv Suggested As Baseball Revenue Source

The Telemeter system of pay-as-you-see offers organized baseball the best means of promoting its own financial interests and of protecting minor leagues against attendance losses caused by telecasts of major league games, it was asserted this month by Paul MacNamara, vice-president of the International Telemeter Corp. A majority interest in Telemeter is owned by Paramount Pictures.

In the past it has made use of local theatres and the house-to-house coaxial cable links installed in localities having community antennas. This made it possible to charge for home Tv on an experimental basis without actually using the air waves and coming into conflict with FCC regulations.

Drive-in Air Conditioner

Individual weather-to-order for drive-in car occupants will be made available through a 25-cent slot machine to sell for $250 per car unit, plus 10% of the take. The Farr Amusement Co., of Houston, Texas, has developed a new coin-operated combination air conditioner and heater for drive-ins. The unit can be attached to the posts next to cars, and would help drive-ins in many sections of the country to operate year-round.

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PROJECTION LIGHT SOURCES

(Continued from page 16)

floor, volatilize more flame material, and bombard these vaporized substances with a denser stream of electrons? The result, if this can be done, is a much brighter arc.

Use of Water-Cooled Jackets

This *can* be done, and the best way to do it is to surround the carbon-feeding jaws with water-cooled metal jackets. But several difficulties are at once encountered with this method. The first is a loss of about 15% of the energy fed to the arc. In other words, to get the same light as before, the current must be stepped up by about 15% when the positive carbon is effectively water-cooled.

Why is this? The water, by removing heat, also removes electrical energy which has been converted to heat—energy which *does not* brighten the arc, but merely raises the temperature of the water which cools the carbon. Current is therefore wasted.

This is not quite as bad as it may seem at first thought. The 15% loss, after all, is not too much. Also, the rate of consumption of the carbons decreases by about 10%, this saving helping to make up for the loss of electricity.

Up to this point our carbon coolers have deprived us of a modicum of screen illumination which, in a few instances, is desperately needed. Wouldn't it be better, at least in the drive-ins, to have current wasted instead of light? We can swap current for light, as previously suggested, by increasing the amperage by 15%, more or less. (This expedient may require us to use the next larger trim of carbons to avoid overload.)

Uniformity of Screen Light

Now that the light-level has been restored to its pre-cooler value, we may wonder just what, if anything, has been gained by using water-cooled carbon jaws. First of all, we notice that the arc burns more smoothly and gives a more uniform light on the screen. We've gained little or no light, and we're wasting current; but the light *is* better. Fewer color-changes at changeovers, too. All these niceties of projection, together with a cooler lamphouse, are to the credit of water-cooled jaws.

But perhaps it is more light that we really want. Will water-cooling allow us to use a current so far above the rated maximum current of our trim that the pictures become *noticeably* brighter? *NO!* not with regular or "super" (Hitex) H.I. positives.

'Refrigeration', Not 'Cooling'

The ordinary types of H.I. positive carbons have large cores and thin shells of harder carbon. It would require refrigeration, not mere water-cooling, to prevent destruction of the crater and loss of the gas-ball with overload currents. Actually, the ordinary H.I. positives *can* stand a *slight* "overload" when efficient water-cooling is used. But the increase in screen light obtained by taking advantage of the slight rise in the overload limit produced by water-cooling is negligible. A good light mere will reveal it, but no one in the audience will notice it.

Carbon Overloading Danger

It should be clear at this point that regular and "super" H.I. carbons burn with maximum efficiency without water-cooling. Equally obvious is that the *slight* increase in light obtained by slightly overloading water-cooled carbons introduces the risk of a real overload with consequent deterioration of screen light. All it takes to disturb such a souped-up arc is a line-surge or an accidentally-

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shortened arc gap—anything, in fact, that momentarily boosts the amperage.

The highest amperage employed in a water-cooled arc should never be more than 5% above the maximum rated current for the size of positive being used. Even this 5% allowance assumes *effective* cooling of the positive carbon. If a 15% boost in current is needed to restore normal light levels, then larger positives must be used.

The writer underscores these facts while also repeating our reminder that water-cooled arcs operate with remarkable stability and provide a more uniformly illuminated screen with smaller accidental color changes so long as the carbons (assumed to be standard or super-high) are not burned more than 5% above their normal current-rating. Certain proponents of carbon-cooling devices have told some "whoppers" in an effort to establish that water-cooling can increase the brightness of regular and super H.I. positives.

Baseless Claims Damaging

It has been asserted for example, that light-meter checks "prove" that water-cooling "increases the brightness of the picture." In one case the writer found that the uncooled arc used for comparison was deliberately overloaded: the carbon cooling merely removed sufficient energy from the arc to allow a gas-ball to be formed inside a symmetrical crater. The same level of screen illumination could have been obtained more economically by discarding the water-cooled jaws and reducing amperage by 5 to 20%.

Screen light invariably increases and becomes more steady whenever the current is reduced from an overload value to a value which does not exceed the current rating of the trim. The maximum current ratings have been carefully determined by the manufacturer. Each rating is a trifle below the overload limit.

In another case, the results of light-meter tests were actually due to a large-diameter mirror of unusually high optical speed, not to the carbon cooling employed in the lamp. This mirror increased light-pick-up from the positive crater by about 25%. Water-cooling of the carbons, however, *decreased* the light from 10 to 20% at the currents employed in this lamp. The net gain in light-output, therefore, is from 5 to 15% over similar trims burned in an uncooled lamphouse using a smaller mirror. By eliminating the water-cooled carbon jaws, the lamp in question registers light-gains up to 25%, these gains being due entirely to the larger, faster mirror.

[TO BE CONTINUED]

TECHNOLOGICAL STANDARDS

(Continued from page 13)

not be used to change the height of the picture.

Variable Aspect Ratio?

W. G. Altria said there had been a great deal of discussion on the need for a standard ratio, but some producers thought that the aspect ratio should be variable and that masking should be adjustable. One Continental system embodied this principle, and Herbert Wilcox had announced that he would use it for a picture. The aspect ratio varied according to the subject and the individual sequences of the film, and the masking was changed as required *during the performance.*

Dr. Knopp said he had seen photographs and drawings of this system. From the theoretical point of view it had much in its favor, but from the practical point of view he anticipated many trials and tribulations. However,

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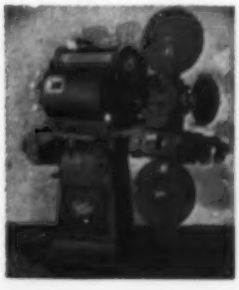

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he would not like to condemn the system merely on descriptions.

Mr. Fielding said he had seen a demonstration of the system. In his opinion, the varying ratio did not achieve the necessary quality of intimacy in close-ups. When the picture size changed for a close-up, the screen appeared to recede. Conversely, in a spectacular scene the screen appeared to get nearer.

Dr. Knopp pointed out that while 94% of all theatres could accommodate a 1.66/1 screen, and 87% could accommodate a 1.75/1 screen, only 13.5% could accommodate the 2.66/1 ratio without reducing the height. He suggested that the two standards of 1.85/1 and 2.55/1 be temporarily adopted, although he thought that ultimately there must be only one standard.

Screen Size Limitation

Some years ago, Dr. Knopp recalled, Mr. Pulman, in a paper presented in association with Mr. Stableford and Mr. H. P. Woods, had precisely determined the optimum size of picture in relation to the auditorium (the figure then given for picture width was just under one-fifth the distance to the back seats). Did these considerations still hold good? Should the new techniques necessitate structural alterations?

Mr. Fielding stressed that screen size could not be determined from any formula, but each theatre must be treated on its merits. Aesthetics was more important today than in the days of the 4 x 3 ratio. In many theatres a psychological effect made the screen appear larger or smaller than it actually was.

Mr. Swingler pointed out that any particular screen size was correct for only half-a-dozen seats in the auditorium. Sight lines were an important consideration. In the past, theatres were designed with a sloping floor, on the fundamental principle that a person could see the whole of the picture between the heads of the two people in front. If the width of the picture were doubled, then planning must take this into account. It was certain, he added, that the public would not for long put up with a large picture showing a loss of definition and brightness.

Screen Image "Jump"

Mr. Walters said that the movement of characters on the large screen was so great that the eye detected a certain jerkiness from frame to frame. It might, be suggested, be necessary to increase picture speed from 24 to 36 or 48 frames per second.

He objected to the proposal that the exhibitor should install the highest possible screen and then determine the width; the difficulty was that in the majority of theatres the width of the proscenium was the determining factor.

British and American standards were, said Dr. Knopp, in substantial agreement as to the brightness of the picture: the British standard called for a centre brightness between 8 and 16 foot-lamberts, and the American standard from 9 to 14. Earl Sponable (20th Century-Fox) had expressed the view that the ideal centre illumination for CinemaScope was 15 foot-lamberts, but he may have had in mind that with such an initial luminance, after depreciation of screen and optics, the average might be down to 12 foot-lamberts, which tied up with the figure suggested by Paramount for VistaVision.

Replying to comments from Mr. Fielding and others, Dr. Knopp pointed out that flicker increased with picture brightness, and was particularly noticeable at the sides of the screen, where it was seen by peripheral vision.

Import of Screen Type

Had the specular type of screen come to stay? asked Mr. Fielding. That would depend to some extent upon whether 3-D was dead, or whether it would again crop up in improved form; it would depend also upon the demands for correct color rendering toward the side seats. The foot-lamberts from a metallized screen were very different in the side seats as compared with a matte white screen. Mr. Fielding suggested that the patron could not stand as many lumens from a specular screen as from a matte white.

Mr. Stableford considered that the metallized screen would eventually be the only type used. The color and intensity of light were more consistent because of the marked decrease and increase in efficiency of a matte screen before and after re-surfacing. He thought there would be a reawakening of interest in the 3-D film.

An important factor to which attention was drawn was the problem of print density. With different sizes and types of screens it was almost impossible to get one type of print that would satisfy everybody.

Is Stereo Sound Necessary?

Peter Rigby expressed the opinion that to ensure audience participation stereophonic sound was a necessity. Cinerama, which provided the fullest audience participation, relied largely upon stereo sound. It was today necessary to have four-track sound, or at least a form of reproduction where the audience heard sound not only from the various positions on the screen but from around the auditorium.

Dr. Knopp thought the size of screen had an important bearing on this point. If one had a 10-foot screen with stereo sound, there would still be no sense of audience participation. Mr. Rigby agreed that there was a minimum size of screen below which stereo sound was not necessary. He complained that stereophonic sound was generally played far too loud.

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